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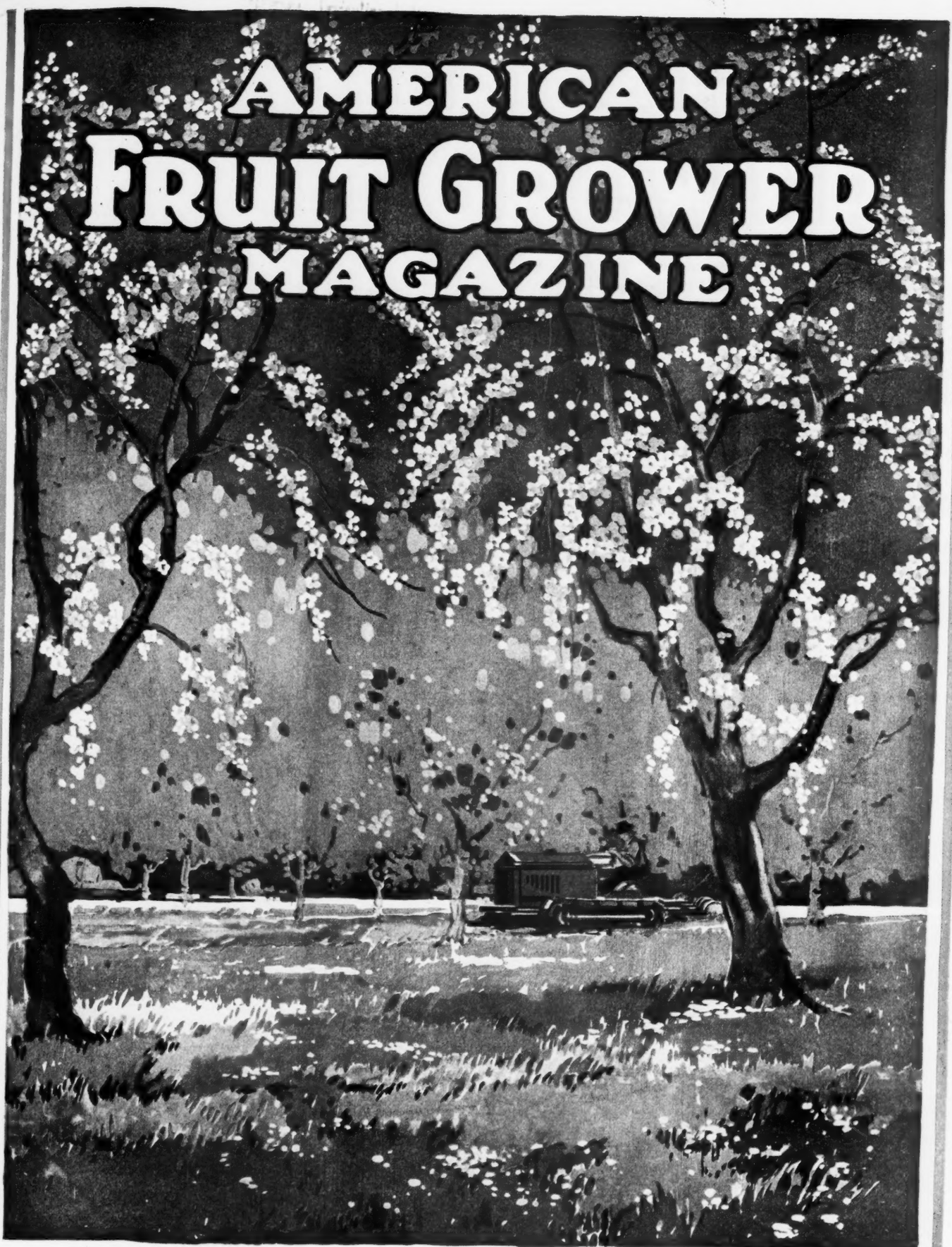

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WHEN BETTER AUTOMOBILES ARE BUILT BUICK WILL BUILD THEM

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VOLUME XLVIII APRIL, 1928 NUMBER 4

The late Prof. Joseph Bachman and one of his creations, the "Bride" grape, a cross between the Brighton and Delaware. A 20-pound crop of delicious red grapes.

A Horticultural Genius of the Ozarks

Forty years of Labor and Experimenting in the Arkansas Foothills gave the World Five Improved Varieties of Grapes.

By Harry B. Taber

WHILE all that was mortal of Joseph Bachman, grape culturist par excellence, passed into the Great Unknown January 3, 1928, his spirit yet lives and carries on in the great work he did the past 47 years as a fruit culturist in Arkansas.

I have seen the lordly Delaware of New York state, the queen of the trailing vine—the Concord—of northwest Arkansas, and the sun-dipped Campbell's Early of central Arkansas, but there are better flavored, better colored grapes than even these, and I found them last summer nestling in a little quarter-acre experiment garden in the outskirts of Hot Springs, Ark. That I would find a wonderful work here I sensed in advance when especially urged by Arthur W. Large, of Chicago, Ill., agricultural agent of the Rock Island Lines, to visit Joseph Bachman, one of the most expert grape culturists in the United States. Mr. Large called him "The Arkansas Burbank," and this was no overstatement.

Visitors Come from Afar

My first intuition was fully verified when on reaching the little cottage about which the vineyard grew, I saw personified the old adage, "If a man can write a better book, etc., the world will make a beaten pathway to his door," for there in the little vineyard were a group of men, in the center of which stood a tall, white-headed sage who proved to be Bachman. The first man I shook hands with, a tall, broad-shouldered young man in shirt sleeves, with a bunch of grapes in his hand, said:

"Zuber is my name. I ran over from Little Rock (60 miles) and brought a couple of grape men with me. We are looking for some of Prof. Bachman's rootstock for planting."

This was N. D. Zuber, of the American Refrigerator Transit Company, doing horticultural work over a large section of the Southwest. He had taken time on a hot July day to take these two men 60 miles and back in his car, to show them the best there is in grape culture in Arkansas! Those with him were W. T. Hale and Peter Wonderlin, of Pearcy, Ark., the latter a native of the famous Rhine River country in Switzerland, who had come to see a fellow-countryman, Joseph Bachman, grower of grapes de luxe.

Then I met in person Joseph Bachman. Tall, stately, silver-haired native of Switzerland, he stood quietly erect, between a row of luscious Delaware vines loaded with red-gold fruit, and a row of Bachman's Early, his own creation, a dark royal purple Arkansas product, and told us simply, yet with boyish eagerness, something about his work in Arkansas.

In 1881 Prof. Bachman came to Altus, Ark., in the western part of the state, from the old country. He was one of the two first grape growers in the state. Later he went to Hot Springs, in Garland county, south Arkansas, where he was located for the past six and a half years. He had experimented with grape growing in Arkansas for 45 years, and had just begun, he said, to learn a little about grapes! In the demonstration garden about him at the time of our visit were over 100 varieties.

The Development of Bachman's Early Grape

Prof. Bachman did not develop his experiments by grafting. Grafting, he said, may make a difference or variation in the size of the grape, or of the vine, but not in the nature of the product. New varieties of grapes are created, Prof. Bachman pointed out, by pollination, cross-breeding, mixing the pollen of one plant with that of another. In this matter was born what is now well known as a leading American grape—the Bachman's Early. This is a large table grape, purple in color, delicious in flavor, and a heavy yielder. Prof. Bachman developed this plant in 1903. It is a cross between the Brighton and the Campbell's Early. As each of these varieties is half-Concord, this makes the Bachman's Early a part Concord, but it matures two weeks earlier than the Concords in south Arkansas, and four weeks earlier than the northwest Arkansas Concords.

"The Concord," Prof. Bachman said, "is the grape for the North, but it has not the quality of the Bachman's Early, or of that of a new variety I am now working on." What might have sounded like boasting coming from others was in reality but a simple statement of fact, simply spoken from the lips of a master craftsman.

"For south Arkansas," N. D. Zuber said, "the Bachman's Early is the ideal grape!" And Zuber's word as a horticulturist is authoritative in Southwest territory.

Arthur W. Large, of Chicago, Ill., who with H. M. Means, horticulturist of the Rock Island Lines, is vitally interested in developing fruit in Arkansas along all their lines, and who had watched the work of Bachman for years,

said: "The development of a suitable grape for Arkansas is one of our most interesting problems. We think Bachman will solve it." So they all came to sit at the feet of this genius of the valley of the hot springs of Arkansas, and to be benefited and guided by his works. As Mr. Large very aptly put it:

"Prof. Bachman has something to show, and you will be surprised at his remarkable understanding of grape culture. He is the real Arkansas Burbank."

A large nursery in New York state concurred with this opinion, it seems, for they purchased from Prof. Bachman the rights on his grape.

Other Varieties in the Bachman Vineyard

Among the many other kinds of grapes in the Bachman vineyard, were several notable species. I will name a few. The Christine is a beautiful white grape, developed in 1916, a Bachman product, of very sweet flavor. This grape turns golden yellow when fully ripe. The Christine is a seedling from Bachman's Early and the Banner, maturing about two weeks later than Bachman's Early.

The Banner, another variety, is a magnificent red grape, a cross between the Lindley and Stark's Star, and the Delaware. Prof. Bachman also sold the rights on this grape, for a good price, retaining a royalty interest.

Then there is the Prima, a combination of Munson's Headlight and the Cassava grape; the Bride, and a dozen other prominent varieties, all of superior quality and flavor. Last but not least, was the new variety which he was developing when called to leave his work unfinished. We were gathered in the front room of the little Bachman cottage, around a table loaded with plates containing a dozen different varieties of [*To Page* 41]

How Pollination Increases Fruit Production

The Study of the Relative Self-Sterility and Inter-Sterility is Applied to the Blossoms of the Pear, Plum, Cherry, Grape, Currant, Gooseberry and the Small Fruits.

By H. G. Swartwout

University of Missouri

PART II

THE SAME GENERAL considerations of fruit setting discussed under apples are applicable to pears, except that the use of nitrogenous fertilizers are rarely advisable. Nitrogen induces succulent growth and increases the seriousness of blight.

The Flemish Beauty and Tyson are rated as self-fruitful varieties and are usually dependable croppers when planted alone. Keiffer, Seckel, Le Conte and Bosc are also rated as self-fruitful, at least in some sections and in some seasons, but the set is nearly always heavier when they are cross-pollinated. Varieties which are generally self-unfruitful are Anjou, Bartlett and Winter Nelis. While lacking sufficient evidence to the contrary, the Garber should always be planted with some other variety. With pears, any other variety will do as a pollinizer, as there is no evidence of inter-sterility between varieties.

Peaches

Peach varieties, at least all that are grown commercially, except the J. H. Hale, are apparently perfectly self-fertile, and under orchard conditions are self-pollinated. Cross-pollination seems to have no effect on the size of the fruit and, therefore, is of no advantage over close or self-pollination. The fruit from orchards of one variety (except J. H. Hale) is as satisfactory as that from mixed orchards. The J. H. Hale is said to bear non-viable pollen. At any rate, it is usually unfruitful when planted alone.

Quinces

The quince ordinarily is not a heavy bloomer, and a fairly large percentage of the flowers produced fall, resulting in rather light crops. This is true of the quince in practically all regions where it is grown in this country. However, such varieties as have been studied have been found self-fertile to a sufficient degree to set normal crops. Bees apparently are of no value in increasing the set, their presence seemingly being without effect.

Plums

There is considerable self-sterility and inter-sterility among plums, and the relation of the various varieties and groups to one another is so intricate that only the more general relationships with a few exceptions will be given.

Varieties of American species of plums, such as Wildgoose, Milton, De Soto and Pottawattamie, are practically all self-sterile. Japanese varieties of plums, like Abundance, Burbank, Chabot and Wickson, are nearly all self-sterile, and many of the varieties of European plums, which includes the Damsons, the prunes, Green Gage (Reine Claude), Pond, Bradshaw, Lombard, and others, are self-sterile, though a fair number are self-fertile. Among the varieties which are self-fertile at least in some sections are the Damsons, Italian Prune, Green Gage, Giant, Victoria and Yellow Egg.

(Above)—Cumberland black raspberry. The cluster at the left was bagged, but not hand pollinated. That at the right is an open pollinated cluster. All black raspberry varieties studied were found to be self-fertile, as shown here.

(Center)—At left is shown a grape flower of the Concord type with the upright stamens characteristic of self-fertile varieties. At right is shown the flower of a self-sterile variety with the reflexed stamens usually found on such varieties. Flowers much enlarged.

(Below)—At the left is shown an open pollinated cluster of McDonald, a blackberry-dewberry hybrid. At the right is shown a cluster which was bagged and hand pollinated. No fruit set as this variety is self-sterile. This is true of most blackberry-dewberry hybrids.

Nearly all varieties within each group, the American, the Japanese and the European, are inter-fertile, though they are not inter-fertile between groups. Japanese varieties and varieties of American plums are inter-fertile, at least to a fair degree, but very few varieties of either of these groups are inter-fertile with varieties of European plums. Hence, European plums are not dependable pollinizers for other plums.

Except with varieties of European plums that are known to be self-fruitful, plum orchards always should be planted with two or more varieties to secure cross-pollination. These two or more varieties should be of the same group unless they are American and Japanese, and even then it is probably safer to use as inter-pollinizers botanically related varieties.

Cherries

Sour cherry varieties, like Early Richmond, Montmorency and English Morello, are all self-fertile. The heavy crops set by scattered trees and orchards of a single variety leave little doubt as to their high degree of self-fertility under widely varying conditions. The Dukes, Royal Duke and May Duke, are self-sterile or at least only partly self-fertile and should be planted with some of the sour varieties for best results. Varieties of sweet cherries are not dependable pollinizers for the Dukes. Certain combinations may be satisfactory, but unless it is known that the varieties in question are effective, sweet cherries should not be planted as pollinizers for Royal Duke, May Duke and other sour cherry sweet cherry hybrids.

All or nearly all commercially important sweet cherry varieties are self-sterile, and inter-sterility is more common than it is in most fruits. In planting sweet cherries, not only must other varieties be used for purposes of cross-pollination, but the varieties selected as pollinizers must be known to be inter-fertile with those to be pollinated.

Grapes

Practically all the commonly planted varieties of American grapes are self-fertile. The varieties that are self-sterile are so due to the production of abortive pollen and hence are not only incapable of setting fruit of that variety, but are ineffective as pollinizers for other varieties. All varieties which produce viable pollen are apparently self-fertile. Fortunately, self-fertile and self-sterile varieties usually can be told by examining the flowers. The stamens of self-fertile varieties are upright; those of most self-sterile varieties are reflexed or curved backward. Among the varieties which are self-fertile are Concord, Moore, Worden, Niagara, Diamond, Delaware and Catawba. These may be planted in large blocks of one variety. Eclipse, Barry, Brighton, Herbert, Massasoit, Lindley and Vergennes are the only better known varieties which are self-sterile. They should be planted in blocks of two to four rows, alter- [*To Page* 20]

Starting the Commercial Peach Orchard

The First of a Series of Three Articles on Peach Culture, from the Selection of the Varieties and the Site for the Orchard, through the Cultural and Spraying Practices to the Time when the Orchard is Established and Yielding.

By J. J. Talbert

University of Missouri

PART I

THE PEACH crop in the United States with the present commercial acreage may amount to 55,000,000 bushels or more during favorable years. Some of the states ranking high in commercial production are as follows: California, Georgia, Arkansas, Texas, New York, New Jersey, North Carolina, Ohio, Missouri, Michigan, Pennsylvania, Maryland and Tennessee.

In what may be termed the central and northern states, excepting certain areas bordering on large bodies of water, peach growing includes a considerable hazard, due to the fact that the peach buds are often killed by temperatures of 10 degrees Fahrenheit or more below zero during the winter season. Late spring freezes and frosts may also play an important role in crop production. Except for home use, therefore, peach growing is frequently discouraged in regions where climatic conditions make the industry too hazardous. Some growers maintain, however, that if they are able to get a crop once in four years, it pays to grow peaches. It must also be said that with proper culture peaches may be grown profitably in many sections where they are not being given attention at this time. Moreover, hardier and later blooming varieties are being developed which may give peach culture an additional impetus in the not far distant future.

With the revival of interest in peach production especially in districts where the industry is established, it is believed that there is a distinct need for much general practical and timely information on peach culture.

Selection of Variety

There is no ideal variety or list of varieties, as every variety has faults and shortcomings. The varieties which seem to meet all conditions in the most satisfactory way can be selected only after careful study of the following factors:

1. Adaptability to conditions in the locality where it is to be planted.
2. Fitness or value for the purpose for which it is to be grown.
3. The season of ripening, in relation to local and distant markets.

The fruit grower should not be induced to buy new and untried varieties because of the pressure of high powered salesmen, beautiful illustrations, glowing descriptions, and extravagant claims of merit. He should be guided by the experience of growers in his immediate locality or county, the suggestions of the county extension agent and the agricultural experiment station.

For home and nearby markets, a succession of varieties is usually desired, so that the season of ripening may be extended over a long period.

To secure the best varieties for local conditions, all factors considered, it is suggested that growers of each state consult their respective agricultural experiment station. Such a procedure is likely to be productive of the best results, as the selection of the right variety or varieties may mean the difference between success and failure.

Peaches may be profitable on stony, thin land if given proper care.

Pollination Problems

Peaches do not require cross-pollination to be fruitful. It is not necessary, therefore, to plant several different varieties in the same block as is generally required for successful apple production. Investigations have generally shown that there is only one variety, Hale (J. H. Hale), which should be planted with other kinds to secure a satisfactory set of fruit. It is important, however, that honeybees be in or near the orchard at blooming time to do the work of cross-pollinating the fruit bloom. This is needed in spite of the fact that peach varieties are generally self-fertile. Perhaps one colony of bees to every one and one-half to two acres of orchard is required for best results, particularly during rainy, cool weather.

Planting

Best Trees the Cheapest.—It is false economy to plant inferior or low-grade fruit trees. The best one-year peach trees which can be secured, will, in the end, be the most economical and profitable.

Work at the Missouri station and elsewhere has shown that growthy, vigorous, well-matured trees withstand transplanting better, are more resistant to dangerous insect pests and fungous diseases, come into bearing earlier and develop into a more profitable orchard than small, stunted and less vigorous trees.

As a rule growers prefer one-year-old peach trees instead of two-year-old, because one-year-old trees can usually be purchased for a less price; the shock of transplanting is not so great; the carriage charges are usually less; and the one-year-old trees are likely to come into bearing just as soon and to be as profitable as two-year-old trees.

Time to Plant.—Whitten, of the Missouri Agricultural Experiment Station, found after many years of experimental work that peach trees in central Missouri planted in the fall generally make a better growth the next season if the planting is followed by a favorable winter, but if followed by a severe winter, the trees dry out and winter-kill to some extent. In south Missouri, fall planting has generally proved to be preferable. Planting in late fall or during early December has been much more satisfactory than planting from October 15 to November. When peach trees are planted a month or six weeks before the weather is cold enough to freeze the soil, the trees may dry out and suffer seriously as a result. The late fall planted trees start root growth as soon as those planted earlier, and they escape the period of several weeks of drying, which may injure early fall planted trees.

Distance of Planting.—In laying off the land for planting a peach orchard, the first decision the growers must make is the amount [To Page 37]

Good culture in a peach orchard just coming into bearing.

The Creation of the Pineapple Industry

The Hawaiian Pineapple Industry didn't just "Grow Up," like Topsy. Its present Dominating Position is the Result of Organization Built on a Scientific Market Analysis. Our Continental Fruit Growers can both Learn and Profit by a study of the Hawaiian Organization, as Many of the Principles can be applied to marketing the Deciduous Fruits.

By A. L. Dean

Director of Experiment Station, Association of Hawaiian Pineapple Canners.

I REMEMBER seeing an English war-time cartoon picturing an insignificant man before a tribunal which was to decide whether or not his occupation was so necessary as to exempt him from military service. To the question regarding his business, he replied, "Painting spots on rocking horses."

Lest anyone entertain the notion that canning pineapples is in the same general category as painting spots on rocking horses, I want to say at once that we know canned pineapple to be a valuable food, filling a worthy place in any diet. To be sure, a good many millions of people have lived and died without eating pineapple, are so living and dying, and will doubtless continue to do so in the future. We hope, however, to reduce the future number. But the same may be said of string beans, automobiles, and operations for appendicitis. At any rate, one of the satisfactions of being connected with the pineapple industry is the knowledge that one is concerned with the production of a thoroughly high-grade product, of real utility, prepared under the best of sanitary conditions.

A Product of the New World

The pineapple is one of the notable gifts of the New World. It appears to have been unknown in the ancient world of Europe, Asia and Africa, but to have spread rapidly throughout the tropics after the discovery of America. Although it does not ordinarily produce seeds, and is propagated by setting out vegetative portions of the plants, such as the leafy crowns from the fruits or the slips borne on the fruit stems, these parts are so resistant to drying that they can be kept in the air for months and yet preserve their power to grow. On this account, it was easy for the early navigators to spread the pineapple far and wide in spite of the slowness of their craft.

There grew up in Europe an interesting industry in growing pineapples in glass houses. It was a luxury for the nobility and the very wealthy. With the advent of the rapid steam navigation, this greenhouse culture gradually died out and the European market was supplied from the West Indies. The pineapple, however, is not well adapted for a fresh fruit trade, since it is decidedly inferior when picked before it is fully ripened on the plant. Once fully ripened, it is very difficult to ship. As a result, residents in colder climates never know what a really first-class pineapple tastes like.

Development of the Industry

Pineapples of a sort were brought to Hawaii many years ago, at least as early as 1809. Not until 1885 was any special attention paid to them. At that time a Captain Kidwell, of horticultural proclivities, attempted to develop a business in growing pines to be shipped to California. He secured planting material of many varieties for trial. None equalled the Smooth Cayenne, and that soon became the standard variety here, in fact the only one cultivated. From Kidwell's endeavors grew the first canning venture in Hawaii in 1892. Matters rather dragged along for several years until the advent of an enthusiastic young Harvard graduate, who thought he saw possibilities in canning pineapples.

The industry did not just naturally grow of its own accord. Like any other business achievement, it has had its dark days as well as its bright ones. At one stage in its youth it seems to have been saved by its first venture in the field of national advertising. This advertising has been steadily followed until Hawaiian canned pineapple is widely known throughout the United States. One does not need to fear, however, that in purchasing a can of Hawaiian pineapple he is making a major contribution to the advertising media. About one-fifth of one cent is the price of the association advertising on a can of pineapple. Although we keenly realize our dependence on advertising to market our product, our consciences do not bother us any on the score of bleeding the consumer to sell himself our products.

At the present time, there are eight companies, operating 10 canneries, which belong to the Association of Hawaiian Pineapple Canners. Associated with one of these companies under a co-operative agreement are two other companies which produce the raw fruit, but do not can it. There are, in addition, two small companies packing less than one per cent of the Hawaiian output, which do not belong to the association. Two of the eight companies are branches of large mainland corporations, the California Packing Corporation and Libby, McNeill and Libby, engaged in producing a wide variety of food products.

Excellent Canning Operations

The cannery operations are on an excellent basis. Ingenious machines have been evolved to solve the particular problems of handling this fruit on a large scale and with great rapidity. A single high speed Ginaca machine will remove the outside shells, take out the good meat left on the inside of the shells, cut off the tops and bottoms, and remove the cores of the fruit at such a rate that less than five minutes are required to the ton of pineapples. A similar mechanical efficiency runs through the whole plant. Special attention has been paid to cleanliness and sanitation. I believe we have reason to be proud of our product. Utilization of what were formerly annoying waste products has made good progress.

By far the greater part of the fruit canned is produced by companies which are doing the canning. One notable exception is the fruit grown by two companies, engaged in other agricultural enterprises, which have a co-operative agreement with one canning company which involves a sharing of profits. A relatively small quantity of fruit is produced by small independent growers who sell their fruit outright to the canners. In short, pineapple growing, like cane growing, is largely corporation agriculture. This is not the place to enter into a discussion either of the economic or social aspects of this situation. This I can say, however, that I could not conscientiously advise any friend of mine with small resources of capital and land to go into pineapple growing as his major dependence for a living, for the same reason that I would not advise him to carry his own fire insurance. A company with its risks spread over considerable areas can afford to grow a difficult crop; the man with all his eggs in one basket, and that a small one, can not.

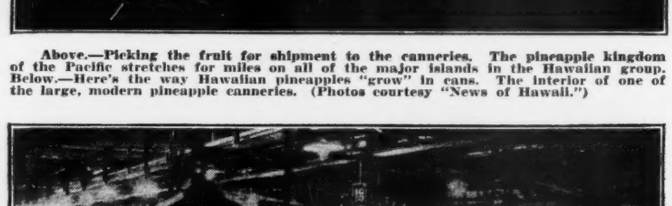
Culture of the Fruit

The culture of the pineapple is an unusually interesting agricultural development. Here we have a plant, a close relative of the Spanish moss which adorns the trees in Florida and elsewhere, which in its native state grew in the half shade of the open forest, falling over and rooting and thus spreading over the ground. I fancy that its roots were mostly in the surface layers of leaf mold. At any rate, it is equipped with aerial roots and can maintain itself for long periods with scant contact with the soil, provided it has moisture and some shade.

We have taken this plant and are growing it in pure stands, 8000 or 9000 plants to the acre, for hundreds of acres together. Not content with that, we are stimulating it with mulch paper and high-grade fertilizers until the mass of vegetation on an acre runs up over 50 tons, and some of our field men feel that they are getting a raw deal when a field fails to yield 20 tons of fruit to the acre in a single crop. That is certainly doing tricks with nature, and she sometimes reminds us that she does not always care for tricks.

The fields intended for planting are given a most thorough preparation by repeated plowings and disking until a very deep and mellow seed bed is established. Where the topography [To Page 33]

Pineapples in the Hawaiian Islands



Above.—Picking the fruit for shipment to the canneries. The pineapple kingdom of the Pacific stretches for miles on all of the major islands in the Hawaiian group. Below.—Here's the way Hawaiian pineapples "grow" in cans. The interior of one of the large, modern pineapple canneries. (Photos courtesy "News of Hawaii.")

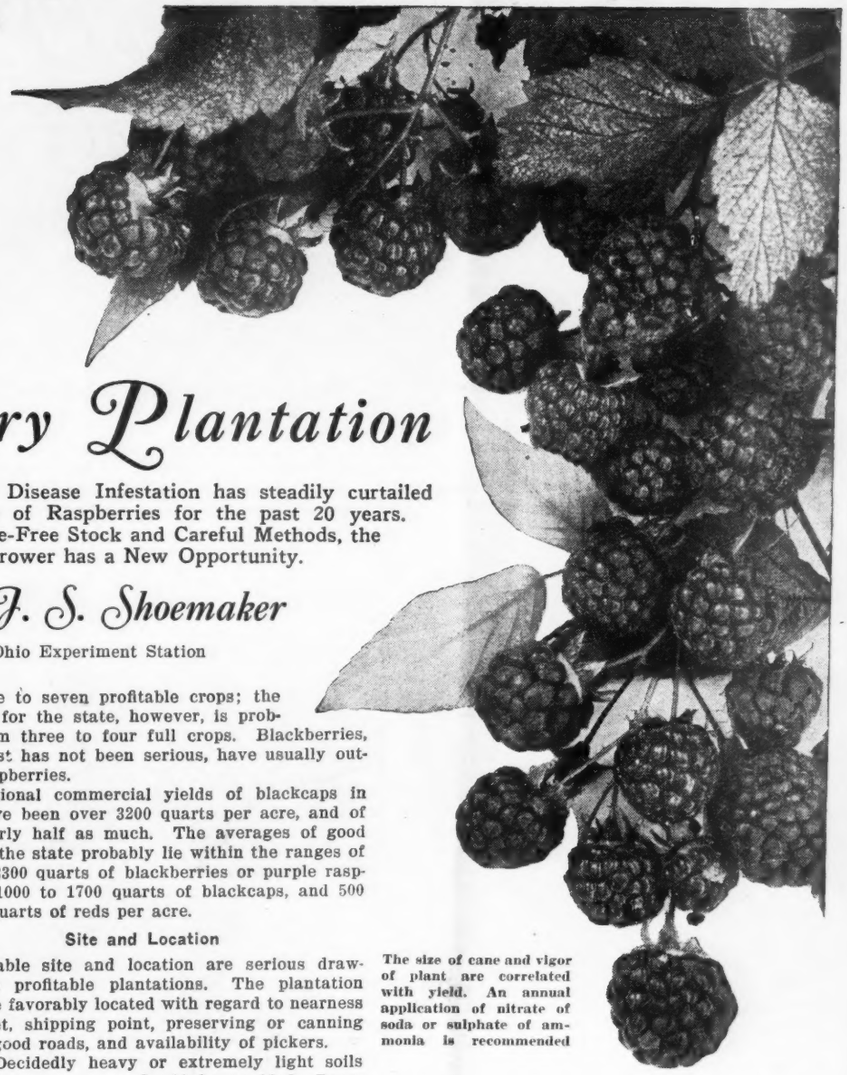
There is a profit to be made from plant propagation as well as from fruit production of raspberries and blackberries. In well cared for plantations, about 10 new blackcap plants can be obtained from each parent plant after a season's growth, and more than double this number the next year.

Planning the Profitable Raspberry Plantation

Widespread Disease Infestation has steadily curtailed the Acreage of Raspberries for the past 20 years. With Disease-Free Stock and Careful Methods, the Raspberry Grower has a New Opportunity.

By J. S. Shoemaker

Ohio Experiment Station



The size of cane and vigor of plant are correlated with yield. An annual application of nitrate of soda or sulphate of ammonia is recommended

THERE has been of recent years a revival of interest in the growing of raspberries in the East and Middle West. This has arisen as a result of a better understanding of diseases and their control, production of healthier stock for planting, a greater demand than ever for the fruit, a steady decline in acreage for the past 20 years, and distinct advances in knowledge of fertilizing, pruning, and other factors concerned with the culture of raspberries.

Healthy Stock for Planting

A prime factor in the success of profitable raspberry plantations is the planting of healthy stock. Nursery inspection services of various states have done much to lower the percentage of diseased stock for planting. In addition to the regular nursery inspections, growers in Ohio have developed further means of dealing with diseases and in co-operation with the Ohio Experiment Station have organized the Ohio Small Fruit Improvement Association. Three grades of exceptionally high standards for black raspberry plants are handled by this association. The "Accredited" grade refers to the plants of the highest quality, used primarily as parent stock for propagation. Its requirements are that the total of virus diseases which are not controlled by spraying (leaf curl, mosaic, and streak) found during the season must not exceed one-fourth per cent, and not more than one-tenth per cent crown gall. For "Registered" stock, the main commercial grade of the association, virus diseases must not exceed two per cent and crown gall one-half per cent. For "Certified" stock, the association places a limit of three per cent for virus diseases and one per cent for crown gall. The association is still in its infancy but members this year list some 20,000 Accredited, 116,000 Registered, and 12,000 Certified black raspberry plants. An effort is made to have the members scattered throughout the state so that growers can obtain the plants without the necessity of long shipment. Over 100,000 Latham red raspberry plants showing considerably less than one per cent red raspberry mosaic and leaf curl during the season are listed by association members. It is recommended that healthy stock be planted some distance from diseased wild or cultivated brambles, and that reds be separated from blacks by at least 20 rods.

Unless the "handle" (in the center) is removed just below the surface of the ground soon after planting, anthracnose infection of new shoots is likely to occur

Life of Plantation and Yield

There are some good sized bramble plantations in Ohio which have produced fair crops to an age of 12 to 15 years, but numerous fields have been destroyed at the end of two or three years. A plantation of blackcaps should be able to produce from five to seven profitable crops; the average for the state, however, is probably from three to four full crops. Blackberries, when rust has not been serious, have usually outlived raspberries.

Exceptional commercial yields of blackcaps in Ohio have been over 3200 quarts per acre, and of reds nearly half as much. The averages of good fields in the state probably lie within the ranges of 1700 to 2300 quarts of blackberries or purple raspberries, 1000 to 1700 quarts of blackcaps, and 500 to 1000 quarts of reds per acre.

Site and Location

Unsuitable site and location are serious drawbacks to profitable plantations. The plantation should be favorably located with regard to nearness to market, shipping point, preserving or canning factory, good roads, and availability of pickers.

Soil.—Decidedly heavy or extremely light soils should be avoided. Raspberries are generally more productive on moderately light soils than on heavier types, and although they succeed fairly well on any soil, unless limited by other factors, a sandy loam is preferred.

Soil and Air Drainage.—An abundant supply of moisture in the soil is essential. Raspberries, however, are likely to be failures on wet soils. The higher parts of the field usually give better results than low-lying or bottom sections. Satisfactory soil drainage is a very important factor in the sucess of raspberry plantations, and all too often productiveness is associated with failure of proper attention to this matter.

Good atmospheric drainage, such as is obtained when the plantation is situated on land sloping enough that the cooler air drains to the lower parts, usually results in less injury from low temperature than when the location is in a "pocket."

Previous Crops.—The question often arises in regard to the advisability of planting raspberries after various crops. Old grass sod plowed and planted to brambles is not very satisfactory. Such soil is usually lacking in proper texture and fertility, is rough and difficult to plant and work properly, and is hard to keep free of grass. Tomatoes or potatoes, when grown on the soil previous to raspberries, may lead to transfer of wilt disease. Land on which corn or other extensively cultivated crops have been grown a year or more previous to planting raspberries is generally suitable.

Planting

Spring Planting.—Tip plants of black and purple raspberries are best set in the early spring. Plants should be obtained from healthy plantations, the closer to home the better. Small sprouts develop which are easily damaged in shipping, planting, and other operations. Extreme care is necessary to avoid destruction of these tender sprouts or growing points. Some growers who are not able to prepare their soil in time for setting in early spring, and who obtain plants from their own plantation or from fields close by, prefer to wait until the new leaves are visible. This method of delayed planting has been observed to give fairly good results in cool, cloudy weather, but in warm, sunshiny days considerable wilting is likely to take place.

Fall Planting.—It is the usual practice for many blackberry growers in Ohio to practice fall planting. Results obtained have been good. On fairly light soil, red raspberries and transplants of blackcaps have also done well when set in late fall. It is a good plan to protect fall planted stock with a mulch or back furrow. Red raspberries and blackberries, of course, are also set in the spring.

Mortality in Planting.—One hundred per cent success in setting plants is the exception rather than the rule. The average is probably not more than 75 per cent for blackcaps when plants are shipped in. Growers who for a number of years have set plants from their own or from neighboring fields and have obtained a 90 per cent stand or better, are often greatly surprised at the amount of loss from shipped plants in spite of the care taken by the nurseryman in packing. It may be better in the long run, however, to suffer the partial loss of newly set plants received from a healthy plantation at some distant point than to feel gratified at an almost perfect stand of plants from a diseased plantation. Failure to obtain a reasonably good stand [*To Page* 35]

The Creation of the Pineapple Industry

The Hawaiian Pineapple Industry didn't just "Grow Up," like Topsy. Its present Dominating Position is the Result of Organization Built on a Scientific Market Analysis. Our Continental Fruit Growers can both Learn and Profit by a study of the Hawaiian Organization, as Many of the Principles can be applied to marketing the Deciduous Fruits.

By A. L. Dean

Director of Experiment Station, Association of Hawaiian Pineapple Canners.

I REMEMBER seeing an English war-time cartoon picturing an insignificant man before a tribunal which was to decide whether or not his occupation was so necessary as to exempt him from military service. To the question regarding his business, he replied, "Painting spots on rocking horses."

Lest anyone entertain the notion that canning pineapples is in the same general category as painting spots on rocking horses, I want to say at once that we know canned pineapple to be a valuable food, filling a worthy place in any diet. To be sure, a good many millions of people have lived and died without eating pineapple, are so living and dying, and will doubtless continue to do so in the future. We hope, however, to reduce the future number. But the same may be said of string beans, automobiles, and operations for appendicitis. At any rate, one of the satisfactions of being connected with the pineapple industry is the knowledge that one is concerned with the production of a thoroughly high-grade product, of real utility, prepared under the best of sanitary conditions.

A Product of the New World

The pineapple is one of the notable gifts of the New World. It appears to have been unknown in the ancient world of Europe, Asia and Africa, but to have spread rapidly throughout the tropics after the discovery of America. Although it does not ordinarily produce seeds, and is propagated by setting out vegetative portions of the plants, such as the leafy crowns from the fruits or the slips borne on the fruit stems, these parts are so resistant to drying that they can be kept in the air for months and yet preserve their power to grow. On this account, it was easy for the early navigators to spread the pineapple far and wide in spite of the slowness of their craft.

There grew up in Europe an interesting industry in growing pineapples in glass houses. It was a luxury for the nobility and the very wealthy. With the advent of the rapid steam navigation, this greenhouse culture gradually died out and the European market was supplied from the West Indies. The pineapple, however, is not well adapted for a fresh fruit trade, since it is decidedly inferior when picked before it is fully ripened on the plant. Once fully ripened, it is very difficult to ship. As a result, residents in colder climates never know what a really first-class pineapple tastes like.

Development of the Industry

Pineapples of a sort were brought to Hawaii many years ago, at least as early as 1809. Not until 1885 was any special attention paid to them. At that time a Captain Kidwell, of horticultural proclivities, attempted to develop a business in growing pines to be shipped to California. He secured planting material of many varieties for trial. None equalled the Smooth Cayenne, and that soon became the standard variety here, in fact the only one cultivated. From Kidwell's endeavors grew the first canning venture in Hawaii in 1892. Matters rather dragged along for several years until the advent of an enthusiastic young Harvard graduate, who thought he saw possibilities in canning pineapples.

The industry did not just naturally grow of its own accord. Like any other business achievement, it has had its dark days as well as its bright ones. At one stage in its youth it seems to have been saved by its first venture in the field of national advertising. This advertising has been steadily followed until Hawaiian canned pineapple is widely known throughout the United States. One does not need to fear, however, that in purchasing a can of Hawaiian pineapple he is making a major contribution to the advertising media. About one-fifth of one cent is the price of the association advertising on a can of pineapple. Although we keenly realize our dependence on advertising to market our product, our consciences do not bother us any on the score of bleeding the consumer to sell himself our products.

At the present time, there are eight companies, operating 10 canneries, which belong to the Association of Hawaiian Pineapple Canners. Associated with one of these companies under a co-operative agreement are two other companies which produce the raw fruit, but do not can it. There are, in addition, two small companies packing less than one per cent of the Hawaiian output, which do not belong to the association. Two of the eight companies are branches of large mainland corporations, the California Packing Corporation and Libby, McNeill and Libby, engaged in producing a wide variety of food products.

Excellent Canning Operations

The cannery operations are on an excellent basis. Ingenious machines have been evolved to solve the particular problems of handling this fruit on a large scale and with great rapidity. A single high speed Ginaca machine will remove the outside shells, take out the good meat left on the inside of the shells, cut off the tops and bottoms, and remove the cores of the fruit at such a rate that less than five minutes are required to the ton of pineapples. A similar mechanical efficiency runs through the whole plant. Special attention has been paid to cleanliness and sanitation. I believe we have reason to be proud of our product. Utilization of what were formerly annoying waste products has made good progress.

By far the greater part of the fruit canned is produced by companies which are doing the canning. One notable exception is the fruit grown by two companies, engaged in other agricultural enterprises, which have a co-operative agreement with one canning company which involves a sharing of profits. A relatively small quantity of fruit is produced by small independent growers who sell their fruit outright to the canners. In short, pineapple growing, like cane growing, is largely corporation agriculture. This is not the place to enter into a discussion either of the economic or social aspects of this situation. This I can say, however, that I could not conscientiously advise any friend of mine with small resources of capital and land to go into pineapple growing as his major dependence for a living, for the same reason that I would not advise him to carry his own fire insurance. A company with its risks spread over considerable areas can afford to grow a difficult crop; the man with all his eggs in one basket, and that a small one, can not.

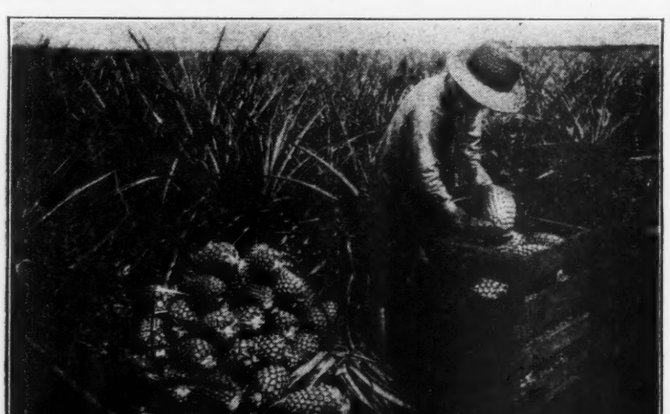
Culture of the Fruit

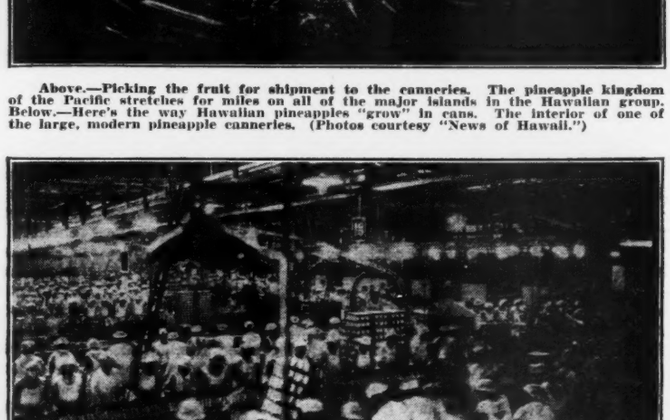
The culture of the pineapple is an unusually interesting agricultural development. Here we have a plant, a close relative of the Spanish moss which adorns the trees in Florida and elsewhere, which in its native state grew in the half shade of the open forest, falling over and rooting and thus spreading over the ground. I fancy that its roots were mostly in the surface layers of leaf mold. At any rate, it is equipped with aerial roots and can maintain itself for long periods with scant contact with the soil, provided it has moisture and some shade.

We have taken this plant and are growing it in pure stands, 8000 or 9000 plants to the acre, for hundreds of acres together. Not content with that, we are stimulating it with mulch paper and high-grade fertilizers until the mass of vegetation on an acre runs up over 50 tons, and some of our field men feel that they are getting a raw deal when a field fails to yield 20 tons of fruit to the acre in a single crop. That is certainly doing tricks with nature, and she sometimes reminds us that she does not always care for tricks.

The fields intended for planting are given a most thorough preparation by repeated plowings and disking until a very deep and mellow seed bed is established. Where the topography [To Page 33]

Pineapples in the Hawaiian Islands

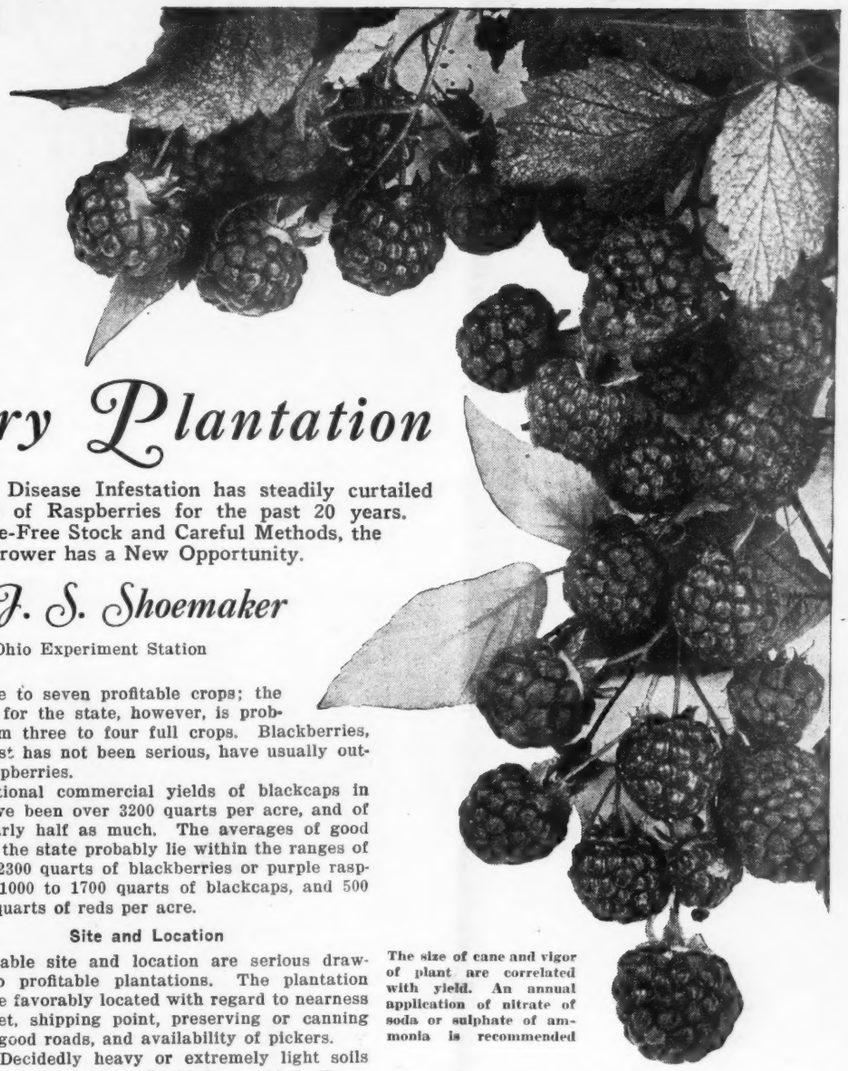




Above.—Picking the fruit for shipment to the canneries. The pineapple kingdom of the Pacific stretches for miles on all of the major islands in the Hawaiian group. Below.—Here's the way Hawaiian pineapples "grow" in cans. The interior of one of the large, modern pineapple canneries. (Photos courtesy "News of Hawaii.")

There is a profit to be made from plant propagation as well as from fruit production of raspberries and blackberries. In well cared for plantations, about 10 new blackcap plants can be obtained from each parent plant after a season's growth, and more than double this number the next year.

Planning the Profitable Raspberry Plantation



Widespread Disease Infestation has steadily curtailed the Acreage of Raspberries for the past 20 years. With Disease-Free Stock and Careful Methods, the Raspberry Grower has a New Opportunity.

By J. S. Shoemaker

Ohio Experiment Station

THERE has been of recent years a revival of interest in the growing of raspberries in the East and Middle West. This has arisen as a result of a better understanding of diseases and their control, production of healthier stock for planting, a greater demand than ever for the fruit, a steady decline in acreage for the past 20 years, and distinct advances in knowledge of fertilizing, pruning, and other factors concerned with the culture of raspberries.

Healthy Stock for Planting

A prime factor in the success of profitable raspberry plantations is the planting of healthy stock. Nursery inspection services of various states have done much to lower the percentage of diseased stock for planting. In addition to the regular nursery inspections, growers in Ohio have developed further means of dealing with diseases and in co-operation with the Ohio Experiment Station have organized the Ohio Small Fruit Improvement Association. Three grades of exceptionally high standards for black raspberry plants are handled by this association. The "Accredited" grade refers to the plants of the highest quality, used primarily as parent stock for propagation. Its requirements are that the total of virus diseases which are not controlled by spraying (leaf curl, mosaic, and streak) found during the season must not exceed one-fourth per cent, and not more than one-tenth per cent crown gall. For "Registered" stock, the main commercial grade of the association, virus diseases must not exceed two per cent and crown gall one-half per cent. For "Certified" stock, the association places a limit of three per cent for virus diseases and one per cent for crown gall. The association is still in its infancy but members this year list some 20,000 Accredited, 116,000 Registered, and 12,000 Certified black raspberry plants. An effort is made to have the members scattered throughout the state so that growers can obtain the plants without the necessity of long shipment. Over 100,000 Latham red raspberry plants showing considerably less than one per cent red raspberry mosaic and leaf curl during the season are listed by association members. It is recommended that healthy stock be planted some distance from diseased wild or cultivated brambles, and that reds be separated from blacks by at least 20 rods.

Unless the "handle" (in the center) is removed just below the surface of the ground soon after planting, anthracnose infection of new shoots is likely to occur

Life of Plantation and Yield

There are some good sized bramble plantations in Ohio which have produced fair crops to an age of 12 to 15 years, but numerous fields have been destroyed at the end of two or three years. A plantation of blackcaps should be able to produce from five to seven profitable crops; the average for the state, however, is probably from three to four full crops. Blackberries, when rust has not been serious, have usually outlived raspberries.

Exceptional commercial yields of blackcaps in Ohio have been over 3200 quarts per acre, and of reds nearly half as much. The averages of good fields in the state probably lie within the ranges of 1700 to 2300 quarts of blackberries or purple raspberries, 1000 to 1700 quarts of blackcaps, and 500 to 1000 quarts of reds per acre.

Site and Location

Unsuitable site and location are serious drawbacks to profitable plantations. The plantation should be favorably located with regard to nearness to market, shipping point, preserving or canning factory, good roads, and availability of pickers.

Soil.—Decidedly heavy or extremely light soils should be avoided. Raspberries are generally more productive on moderately light soils than on heavier types, and although they succeed fairly well on any soil, unless limited by other factors, a sandy loam is preferred.

Soil and Air Drainage.—An abundant supply of moisture in the soil is essential. Raspberries, however, are likely to be failures on wet soils. The higher parts of the field usually give better results than low-lying or bottom sections. Satisfactory soil drainage is a very important factor in the sucess of raspberry plantations, and all too often productiveness is associated with failure of proper attention to this matter.

Good atmospheric drainage, such as is obtained when the plantation is situated on land sloping enough that the cooler air drains to the lower parts, usually results in less injury from low temperature than when the location is in a "pocket."

Previous Crops.—The question often arises in regard to the advisability of planting raspberries after various crops. Old grass sod plowed and planted to brambles is not very satisfactory. Such soil is usually lacking in proper texture and fertility, is rough and difficult to plant and work properly, and is hard to keep free of grass. Tomatoes or potatoes, when grown on the soil previous to raspberries, may lead to transfer of wilt disease. Land on which corn or other extensively cultivated crops have been grown a year or more previous to planting raspberries is generally suitable.

The size of cane and vigor of plant are correlated with yield. An annual application of nitrate of soda or sulphate of ammonia is recommended

Planting

Spring Planting.—Tip plants of black and purple raspberries are best set in the early spring. Plants should be obtained from healthy plantations, the closer to home the better. Small sprouts develop which are easily damaged in shipping, planting, and other operations. Extreme care is necessary to avoid destruction of these tender sprouts or growing points. Some growers who are not able to prepare their soil in time for setting in early spring, and who obtain plants from their own plantation or from fields close by, prefer to wait until the new leaves are visible. This method of delayed planting has been observed to give fairly good results in cool, cloudy weather, but in warm, sunshiny days considerable wilting is likely to take place.

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Mortality in Planting.—One hundred per cent success in setting plants is the exception rather than the rule. The average is probably not more than 75 per cent for blackcaps when plants are shipped in. Growers who for a number of years have set plants from their own or from neighboring fields and have obtained a 90 per cent stand or better, are often greatly surprised at the amount of loss from shipped plants in spite of the care taken by the nurseryman in packing. It may be better in the long run, however, to suffer the partial loss of newly set plants received from a healthy plantation at some distant point than to feel gratified at an almost perfect stand of plants from a diseased plantation. Failure to obtain a reasonably good stand [*To Page* 35]

The Japanese Quince Promises a Profit to Commercial Growers

The Common European Quince has long been Appreciated as a Source of Pectin for Fruit Jellies. The Japanese Quince Provides a Valuable Fruit Acid without Sacrificing its Pectin-Producing Qualities.

By C. P. Lathrop

National Preservers Association

SINCE the fresh fruit market consumes the major part of the fruits commercially grown in America, the kinds and varieties of fruits largely produced are those best suited for shipping, ultimate retail distribution, and early consumption as fresh, raw fruit. Their present popularity results from their production of a high yield per acre of firm, sound, bright colored fruit that retains its fresh appearance for a long time, does not readily soften or mold, and has a pleasing flavor. As usually eaten in the fresh, raw condition, only small quantities of sugar or none are desired with the fruits. To have an attractive flavor, therefore, the fruits themselves must possess a sub-acid to somewhat sweet taste. A sour or acid tasting fruit would require too much sugar to make it a desirable dessert and fresh market fruit.

Yet quite a quantity of this fruit sent to the fresh fruit market is not consumed as fresh fruit. Many food manufacturing industries must depend upon such fruit for securing at least part of their fruit supply requirements. Such manufacturing firms purchase this fruit most heavily when the incoming receipts are largest. They serve in this way to help stabilize the market by removing the depressing surplus from fresh fruit competition, yet preserve the fruit in many ways for consumption after the fresh fruit season.

Some Fruit Grown Primarily for Canning

On the other hand, some fruit growing regions, although they ship some fruit to the fresh market trade, are devoted primarily to supplying fruit for the canning and preserving industries. The varieties of fruit grown in these specialized regions of production, naturally, are more nearly adapted to the particular requirements of the canning and preserving industries. Among such requirements, those of texture, color, flavor, shape, size, yields, and adaptation to the region are of first consideration, since defects in any of these characters are not easily remedied later in the manufacturing process. The factor of degree of acidity or taste can be satisfactorily modified at the time of cooking. Thus, to avoid a sacrifice in the perfection of those requirements not so easily remedied in the subsequent manufacturing process, the question of initial acidity of the variety of fruit is not of equal importance and the quantity present is frequently deficient for canning and preserving purposes.

Whether for use in canning, preserving, jelly making, fountain crushed fruits and fruit syrups, pie fillings, etc., the fruits must be cooked and sterilized to prevent spoilage. To avoid the resultant watery taste and loss or destruction of the fresh fruit color, flavor and firmness, large quantities of sugar must be cooked with the fruit. Since the fruits when in their fresh, raw condition already were fairly sweet, this large addition of sugar would make such fruit so sweet tasting that considerable of its valuable fruit flavor would apparently be hidden and remain unnoticed because of the very conspicuous and distracting sweetness.

To overcome this condition and keep the natural flavor of the fruit present a conspicuous feature of the product, manufacturers have found the addition of small quantities of fruit acids secured from fruits which have it in great surplus abundance very satisfactory.

The natural acid in most of the berry fruits like strawberry, raspberry, Loganberry, gooseberry, cranberry, and currant, also in the pineapple, is citric; that in the peach, citric and l-malic; that in the grape, tartaric and l-malic; while that in the cherry, plum, quince, apple and apricot is largely l-malic. Furthermore, manufacturers of canned fruits, jellies and other fruit products have found that the most natural and desirable results are to be secured only when the same fruit acid is added as is native to the fruit being preserved. On this principle, citric acid is added to preserved strawberries, raspberries, Loganberries, cranberries, currants, gooseberries and other fruits to which citric acid is native. But to preserved plums, quinces, cherries, apples, apricots, grapes and cherries, the best results are secured by the addition of l-malic acid.

Figure 1. Compare the size and texture of the Japanese Quince, above, with the European Quince, below. (Reduced one-half.)

Figure 2. Japanese Quince (Chaenomeles Japonica versicolor), as grown at Boston, Mass. The shrub is 4 to 5 feet high and bears profusely. The fruit is 3 to 4 inches in length. This quince should be planted 6 feet by 10 feet.

Japanese Quince a Source of Acid

The lemon, which has from five to seven per cent of citric acid, has proved to be the best commercial source of citric acid for use with those fruits where addition of citric acid is desired. Since no fruits other than grape have tartaric acid, even though found abundantly in the grape, tartaric acid would have little use in the fruit preserving industries if an abundant source of l-malic acid were available for use with those fruits requiring additional l-malic acid. Unfortunately, until the recent discovery in our laboratory of the very high l-malic acid content of the Japanese quince, there was no promising satisfactory source of supply of this l-malic acid. The acid of this fruit is 100 per cent l-malic acid. No citric acid is present. The concentrated water extract of the Japanese quince due to its slight flavor, if any, and the relatively small quantity necessary to use because of the very high l-malic acid content (4.0-5.75 per cent in the fruit), may be used to advantage without purification from its pectin, fruit salts, and small sugar content. With the lemon, on the other hand, the citric acid must be separated from the lemon juice so as to be free from the strong lemon flavor. Thus, the preserver and canner are not dependent upon an expensive manufacturing process for their supply of l-malic acid. They merely need to buy the raw Japanese quince fruit and use it or its extracted juice.

Qualities of the Fruit

The fruit of the Japanese quince has many features of merit. Those of the best varieties are either equal or larger in size to the common European market quince. They are borne heavily and at an earlier age than the ordinary European type of quince. The skin has a pleasant aromatic perfume. The flesh is very solid, firm and of fine grain. The carpels are rather fleshy, and as shown in the upper illustration in Figure 1, the seed cells are large and abundantly filled, running from 10 to 20 seeds per cell and well over 50 seeds per fruit. The seeds are not slimy or muscilagenous like the European quince, thus there is little tendency for the racks to slip in pressing out the Japanese quince juice. The fruit is quite resistant to rot diseases, and holds up remarkably long in cold warehouse storage. Its cut surfaces do not darken on exposure to air, thus its juice likewise remains very light colored. The thawed fruits, after having been held frozen for a long time, are perceptibly softened and show a somewhat wilted appearance, while juice will run slightly with considerable hand pressure. No new or objectionable flavors develop. The fruits for several days after thawing neither discolor, ferment or mold. Thus the frozen storage of the Japanese quince is a commercial possibility. Likewise the sliced fruit may be dried to reduce freight and storage costs. Its flesh and juice are free from starch (unlike the European quince) so that direct use of its juice with other fruits would not introduce the cloudy starch-tannin haze. The fruit is quite high in pectin as well as l-malic acid, and very low in sugar contents, enabling a very high concentration of its juice to be made for storage or other purposes.

The Japanese quince and its juice because of their very high l-malic acid content, have many economic uses and applications. In all food products whose fruit constituent has l-malic as its characteristic acid, yet does not furnish in itself the total acidity required to bring out the maximum fruit flavor present, the fruit or the juice of the Japanese quince can be used for such purpose. They may also find a place in [To Page 39]

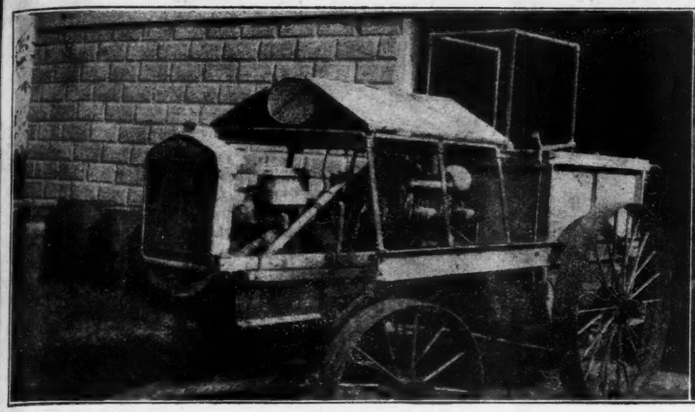


Illustration No. 1. This outfit has a four-cylinder pump and a 300-gallon tank. With this outfit and two guns, fifty acres are sprayed seven to eight times a year.

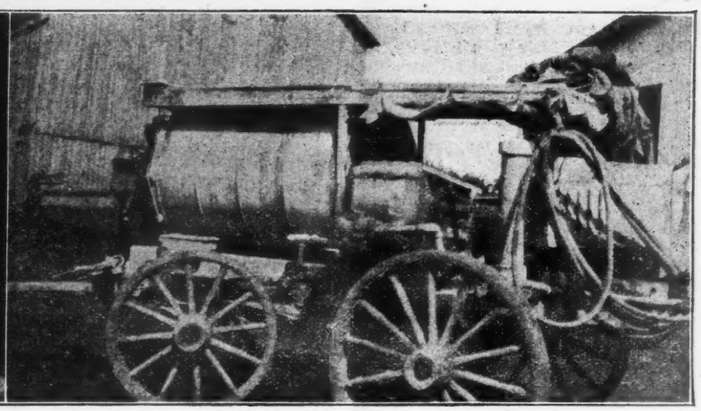


Illustration No. 2. A spray rig with an old car engine that sprayed 90 acres of bearing apples in three days, under 400 pounds pressure, and connected with a pipe line.

Put a Four Cylinder Engine In Your Old Spray Rig

Effective Spraying Requires Pressure. Should the Engine "Lay Down" while the Pump and Tank have years of Useful Service to give, a Light Car Power Unit can be Usefully Employed to give Years of Additional Life to the Outfit.

By A. L. Pierstorff
New Jersey College of Agriculture

"GOOD MORNING, Mr. Roberts! How's everything going?"

"Why, good morning, Mr. Foster! Good morning! Just the man I'm looking for! Can't seem to get any power out of this darn spray engine, but I don't suppose a county agent can help me much with that," said Mr. Roberts.

"Well, let's see," said Mr. Foster, county agricultural agent. "How long have you had that spray engine?"

"Why, about two years, I guess."

"I'll tell you, Mr. Roberts. The trouble with a lot of spray rig engines is that they do not have enough reserve power. After one or two seasons' work, most stationary engines decrease about half in horsepower and then if they are not in tiptop shape, they cannot pull a 17-gallon per minute pump with two guns open and keep the pressure up to 300 or 350 pounds.

Light Car Power Unit Sometimes Employed

"The way some of our fruit growers solve that problem is by taking the motor out of a used light car and mounting that on their spray rig. Of course, some men can't do that, for the reason that their land is too hilly or the ground too soft in the spring or for some other reason, and the car motor weighs a few hundred pounds more than most stationary engines. But your orchard is fairly level and not very wet in the spring. I think you could use that type of engine to advantage, and you are sure to have plenty of power at all times," said Mr. Foster.

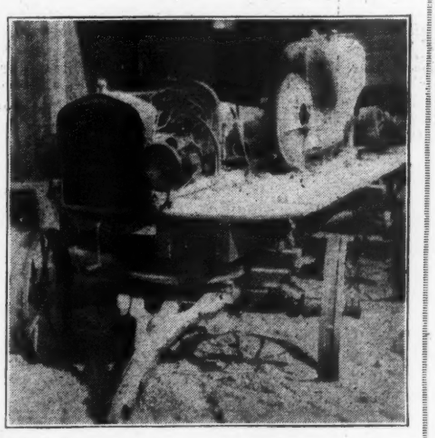
"I have an old car that I seldom use, but the motor is in good shape. How would that do to hook up to this pump?" asked Mr. Roberts.

"Why, fine! The men around Glassboro have them hooked up to all makes of pumps and some of those rigs have been running for six and seven years."

"How would you go about hooking it up?" asked Mr. Roberts.

"You can fix the engine like some of those men have theirs. Here are some pictures of a few rigs I took the other day," said Mr. Foster. (Shown in illustrations 3, 6 and 7.

"First you disconnect the drive shaft housing, cut off the frame of the car just back of the transmission and leave the engine mounted on this frame. Loosen the frame and engine from the rest of the car and mount them on the skids of your spray rig, either in front or behind. It makes little difference in its efficiency or ease in hauling.



Illustrations Nos. 3, 4 and 5. Three views of Mr. Kanale's duster. No. 3, above, shows the three skids or sills upon which the rig is mounted. No. 4, at the left, below, is a side view, showing the relative position of engine and duster. No. 5, at the right, below, gives a view of the rear of the outfit, and shows the underslung platform for the operator. A 10-inch pulley supplants the left rear wheel, and transmits the power to the duster by means of a belt.

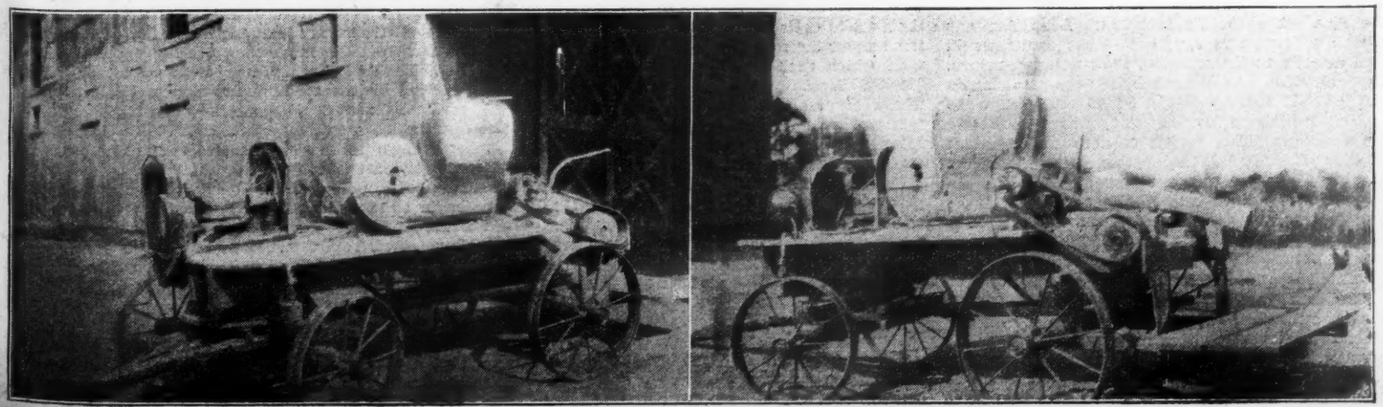
Connecting the Engine

"The piece of the drive shaft projecting from the transmission housing is next removed. Cut off a piece of a rear axle about 12 to 14 inches long, square it on one end and slot it on the other for a key, or drill a hole through it to fasten the sprocket gear on with. Put this piece of axle in place of the drive shaft. Now you have to make this piece of axle, which is to hold a gear rigid. To do this, cut off a six to eight-inch piece of rear axle housing next to the wheel, partially fill one face of it with babbitt metal or solder so it will fit flush up against the transmission housing. Drill holes in it to fit the holes in the transmission case. The roller bearing and sleeve are left in place in the axle housing. To keep the grease from running out, the piece of axle is fitted with grease retainers, felt washer and steel bearing cap. You can get these small parts at a service station.

"Now fasten a roller chain sprocket gear on the end of the piece of axle, or a cog gear. The roller chain is the easier to line up and hook to your pump. Some use a gear drive where the pump is already equipped with reduction gears, like this one. (Illustration 8.) You will want a reduction of from four to seven times, depending on your pump and on whether you wish to run the engine in low or high gear."

"Won't that engine get hot without a water pump on it?" asked Mr. Roberts.

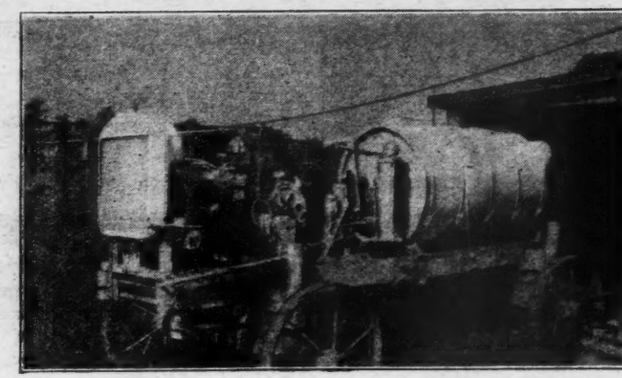
"Oh, it may get a little warm, but if you keep the fan belt tight and the radiator filled, you won't have any trouble. Or you can buy a water pump for a few dollars and put that on. Some men have even discarded their radiator and fan and pull the spray materials through the engine by suction of



the spray pump. I don't like that so well as it might get clogged up.

"Some rigs I have seen have the universal joint and a piece of the drive shaft left on. The sprocket gear is mounted next to the universal joint and two bearings on the piece of drive shaft to make it rigid. That works, too, but may be harder to rig up. This rig (Illustration 9) is geared that way.

"Here is a picture (Illustration 2) of a spray rig with an old car engine that sprayed 90 acres of bearing apples in three days. Mr. Brown, who owns this rig, was installing a stationary spray plant. We had his orchard pipe line all laid, but the big 30-gallon pumps had not arrived. He had to spray, so he hooked



and 5.) He got the idea from Dr. Hendlee, who uses one on his own farm.

"You just take any make of light car, the lighter the better, strip off the wheels, body, fenders, springs and front axle. Mount the car frame on two skids two by 10 inches (Illustration 3) on the right side of a low-wheeled wagon. The right gear axle and housing are cut off and a wooden plug fitted around the axle and into the housing to keep the grease from running out. Then drill a half-inch hole through the housing, wooden plug, axle and all. This keeps that side of the axle from turning. Or take it to the garage and have them fuse the housing and the axle with an acetylene torch. That works, too. Then you put a 10-inch

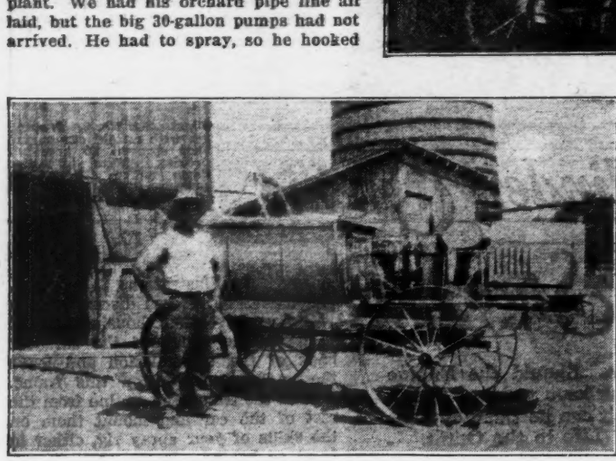


Illustration No. 6 (above). There is an abundance of reserve power in this outfit. Engine mounted on rear.
Illustration No. 7 (left). Leave the hood on, to protect the engine from dust and spray material.

Illustration No. 8 (right). In this cog gear drive two bearings keep the drive shaft rigid.
Illustration No. 9 (below). In this cog gear drive the connection is made without removing universal joint from car engine.

this rig to his pipe line at the house and kept 400 pounds pressure all the while he was spraying," said Mr. Foster.

"It looks pretty good to me and I've a half notion to try it after I get this spray on. When I start to spray I like to keep going and I need good pressure or I can't control scab and codling moth."

"That's right," said Mr. Foster.

"What are those other pictures you have there?" asked Mr. Roberts.

Dusting by Means of a Pulley and Belt

"Oh, those are some snaps I took of Mr. Kandle's duster. (Illustrations 3, 4

pulley in place of the left rear wheel, line up your duster which is mounted on a third skid near the left side of the wagon, put on a belt and you are ready to dust. An underslung platform is built on behind, as you see here, for the duster operator to stand on. (Illustration 5.)

"You notice one headlight is turned to the rear and one to the front. (Illustration 3.) If you want to dust at night or early in the morning, both the driver and operator can see," said Mr. Foster.

"It's sure a clever idea and I'll bet it will dust, too," said Mr. Roberts.

"It sure will, as it has [*To Page* 39]

How the Rural Credit System Works

Through the Medium of the Intermediate Credit Banks it is Possible to secure Finances for Culture, Spraying and Marketing Fruit Crops. The Form of Credit Organization.

By Ward M. Buckles
Manager Intermediate Credit Bank of Spokane

CO-OPERATIVE marketing organizations frequently find it desirable to finance their members during the production period of the year as well as to advance them money on the warehoused products after they have been stored and graded. Production credit is recognized by every banker as one of the most difficult forms of credit to handle. The Intermediate Credit Banks frequently have requests from farmers for loans for production purposes. Many farmers obtained the idea when the Federal Farm Loan Act was passed a few years ago, that these banks would lend directly to them, taking their notes in return. However, Congress did not make such provision in the law. It authorized the 12 government banks to lend directly to farmers' co-operative marketing organizations. This they have done to the extent of about $365,000,000, thereby benefiting more than a million farmers who are members of the co-operative organizations. Money obtained by the co-operative, of course, is advanced to the grower so that he may have a portion of his crop returns almost immediately upon delivery of his crop.

Co-operatives Form Credit Corporations

The other activity of the Intermediate Credit Banks, authorized by the act, is to rediscount farmers' notes when taken by agricultural credit corporations, livestock loan companies, or other lending institutions, provided, of course, there is ample collateral back of them. To date they have rediscounted such notes amounting to $244,000,000. A number of co-operative marketing organizations, wishing to advance funds to their members to help them make their crop, have formed credit corporations under their state laws. The minimum capital with which such a corporation can be started is $10,000. Most of them have a much larger capital. These corporations are permitted to rediscount farmers' notes, when properly secured, with the Intermediate Credit Bank to the extent of six or eight times the amount of the capital stock.

In the Pacific Northwest one of the best examples of this sort of service is found in the Wenatchee District Co-operative Association, which handles a large proportion of the apples grown in the Wenatchee district and is a "simon pure" co-operative organization formed under the co-operative laws of the state.

Although some 25 agricultural commodities have been classified by the Federal Farm Loan Board as stable agricultural commodities upon which direct loans can be made to co-operative marketing associations, apples have not been included; therefore, the Wenatchee co-operative found that it was not possible to utilize its product as collateral for a direct loan. It therefore organized a credit corporation, which has a fluctuating capital stock, depending upon the amount of loans rediscounted. The capital ranges between $50,000 and $80,000. It makes loans to its members only and for production purposes. It takes four notes secured by chattel mortgages on growing crops. No advances are made, however, until after the frost period, and then advances are made periodically during the season from the latter part of May up until October. Each of these notes is endorsed and rediscounted by the credit corporation with the Intermediate Credit Bank, and they are also endorsed by the co-operative association. The apples, of course, go to the co-operative marketing association and are marketed according to the standard form of agreement. In the fall, when the apples begin to move, a sinking or trust fund is created from the sale of the apples, that is, a small amount is retained from the returns of the sale from each box of apples. As a sufficient amount is received, the notes are taken up at the Intermediate Credit Bank.

Sinking Fund Created

While each loan is covered by a chattel mortgage on the growing crop, there is also executed by the co-operative association and the agricultural credit corporation an agreement, or contract, which op-

erates as a chattel mortgage. This provides for the creation of a sinking fund, the movement of the apples, and any necessary insurance desired, etc. This contract is filed in the counties where the co-operative association operates and is assigned to the Federal Intermediate Credit Bank, so it in reality has a mortgage covering all the apples of the co-operative association when they are received by that organization in the fall, as well as a specific chattel mortgage of individuals.

This may seem like a rather detailed account of the machinery of making this type of loan. However, it shows that a service is being rendered without materially inconveniencing the apple growers of this district and that the Intermediate Credit Bank does function in this respect. Funds are furnished to the credit corporation at the rate of four and one-half per cent and it in turn charges six per cent. The stock in the corporation has paid eight per cent, and in view of the fact that the co-operative association owns a considerable amount of the stock, it makes a profit on these dividends and has been able to effect a great saving in interest. The "Jim-Hill-O-Gram" of May last year stated that the money formerly had cost the borrowers from nine and one-half to 11.4 per cent per annum. Thus the rate to the borrowers has not only been materially reduced but, in addition, through the investment of stock in the credit corporation, the co-operative association has made a comfortable profit.

Co-operation Rests on Marketing Efficiency

THE "BALLYHOO" days of agricultural co-operation have passed. No longer is the "sign 'em up" campaign the chief aim of farmer business organization. Agricultural co-operation today, says Chris L. Christensen, of the United States Department of Agriculture, is emphasizing better marketing services and increased business efficiency.

Three distinct phases of agricultural co-operation since 1905 are cited by Mr. Christensen, who is in charge of the Division of Co-operative Marketing in the Bureau of Agricultural Economics. In the 15 years from 1905 to 1920, he says, large gains were made in the number of farmers' elevators, livestock shipping associations, co-operative creameries, fruit-packing associations, fluid-milk organizations, and the like. These were typically local in nature and relatively small in annual overturn. They were designed to perform the first stages of the marketing process.

From 1918 to 1925 the formation of large-scale marketing organizations was a striking feature of co-operative development. Some of these attempted the performance of more advanced stages of the marketing process, even going into terminal market operations. Others attempted regional pools, large in volume and in the area covered. Still others sought to improve marketing services and promote payment of differentials for quality, standardization of reliable products, and study of and response to consumer preferences. A feature of this growth was the prevalence of "iron-clad" and long-term contracts providing heavy penalties for selling outside the pool. Some of these organizations have failed, others have modified their practices.

"Members of present-day organizations," Mr. Christensen says, "are being selected rather than merely signed up wholesale. Membership contracts are being modified to meet the financial and other economic conditions of the grower. Notions of arbitrary price fixing by co-operative organizations have been abandoned in favor of efficient business practices. Co-operative managers, directors, and leading growers, instead of merely admiring the beauties of co-operation, are thinking of its problems—financing, selling, management, better grading and standardization, and getting a product of uniform quality to market.

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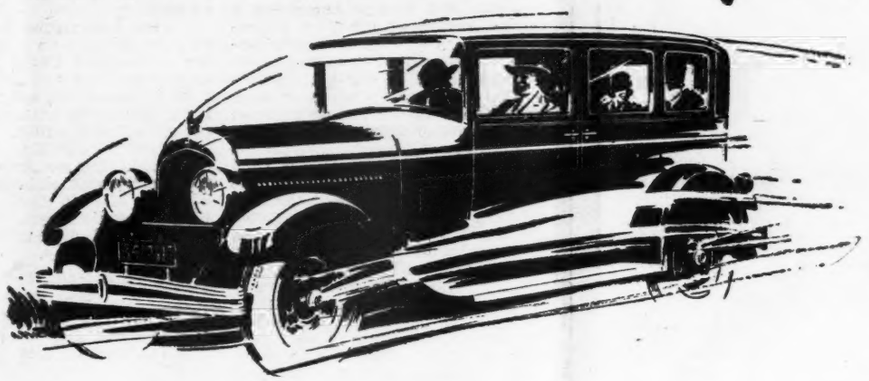

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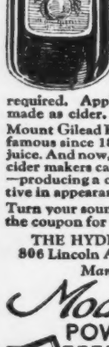

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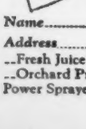

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Excess Lime in Sprays and Dusts

The Experiments in Ohio with the use of Excess Lime, and with High Dilutions of Spray Materials have Attracted Wide Attention. Mr. Ballou's Experiments with Dry Lime-Sulphur and Hydrated Lime are of Especial Interest.

By F. H. Ballou and J. P. Lewis
Ohio Experiment Station

IN THE FALL of 1926, the horticultural department of the Ohio Experiment Station completed a five-year period of spraying experiments. Those very carefully conducted tests were carried on in two southeastern counties of our state where the fungous diseases of apple scab and apple blotch are seriously prevalent on varieties which are subject to these destructive forces. Bulletin No. 413, recently distributed by the Ohio Experiment Station, describes the more important features of the five-year term of spraying operations, contains a great deal of compactly and conveniently arranged data, and is generously illustrated by photographs. It is free to all who are sufficiently interested in spraying to ask for it.

It is not my purpose, at the present time, to enter into a detailed review of the five-year experimental spraying projects now completed, although the history of the rather strange circumstances under which they were conceived and planned; the conditions under which they were conducted; and the criticisms from scientific sources which their clearly-defined results have occasioned, compose a story so filled with interesting and surprising events and results, that it would be difficult to duplicate it in similar horticultural activities of the future. It is desirable, however, that we retain in memory, certain outstanding results obtained in the spraying tests referred to, no matter what our methods or practices in combating fungous diseases and insect enemies in coming years may prove to be. These particular object lessons so clearly developing in our experimental projects, which a great many of our Ohio apple growers—and a number from other states, as well—visited our test orchards especially to see and study, were as follows:

Results from Various Spray Solutions

1. That so-called standard Bordeaux mixture containing from three to four pounds of copper sulphate to 50 gallons of water, while, of course, an effective fungicide, very frequently is destructive to foliage and fruit when used in the apple orchard.

2. That in control of both apple blotch and apple scab, Bordeaux containing but one-half, one-third or even one-fourth the usually recommended amount of copper sulphate, with three parts of high grade hydrated lime to one part of copper, was equally effective as a fungicide when very carefully and thoroughly applied in the form of a fine, mist-like spray, and far less injurious to foliage and fruit.

3. That even total elimination of copper sulphate from the so-termed "standard" Bordeaux, leaving but the nine pounds of high-grade hydrated lime to 50 gallons of water, by no means totally destroyed the fungicidal properties of the resulting spray solution.

4. That commercial liquid lime-sulphur *is an effective fungicide* equal in some respects and superior in others as compared with standard Bordeaux, both in prevention of apple scab and apple blotch; and that while not entirely safe to use during periods of abnormally low temperature in early spring-time on newly-unfolding foliage, or upon even fully developed foliage and growing fruit of the apple during periods of hot, summer weather, is far less likely to cause injury than is the copper-lime compound of generally recommended strength.

5. That commercial lime-sulphur is fully as effective as a fungicide as is the commercial liquid form of the same compound and is considerably safer to use—rarely causing any burning of foliage or blistering of fruit in periods of hot weather.

6. That lime-sulphur sprays used throughout the summer season exert a distinctly beneficial effect in holding San Jose scale in check, as compared with copper-lime sprays under which newly-hatched scale-mites apparently thrive and develop.

Timeliness and Thoroughness Necessary

7. That *timeliness* and *thoroughness* in application of sprays constitute fundamental and important requisites in combating fungous diseases of fruit and foliage.

Absolute thoroughness does not imply wastefulness. It simply means intelligent, careful, faithful, conscientious work. When our orchardists come to fully realize the economic value of really skilful, high-class, "honest to goodness" workmanship in applying their sprays (or their dusts), fungicides of much more dilute or mild formulas may be employed successfully—especially in the after-bloom sprays in the apple orchard—and there will be no harmful effects.

8. That the long-existing practice of applying to all varieties of apples, throughout the entire spraying period, uniformly and too often dangerously concentrated sprays, is one bordering closely on folly.

In prevention of apple scab except, perhaps, for the application at the more critical time which, usually, is just previous to the blooming period, sprays of one-half the commonly recommended strength, so far as the fungicidal elements contained therein are concerned, are entirely adequate. Especially is this true where orchards or parts of orchards are composed of varieties possessing considerable natural resistance to the disease of apple scab. Baldwin, Jonathan Grimes, Sutton, Golden Delicious and York Imperial are representatives of a group of apples not easily infected by scab, although by no means immune from it under conditions highly favorable to such infection.

Where apple blotch is to be reckoned with, and where we know it to have been seriously prevalent within recent years, a copper-lime or lime-sulphur spray of standard strength should be used two and four weeks after bloom—even at the risk of doing some injury to the foliage and fruit. The application four weeks after bloom, in by far the larger number of cases, may be considered the *special and all-important blotch spray*. Even under conditions in which blotch is known to be present in the orchard, the petal-fall spraying and the application in July or August may well be made with dilute fungicides plus the usual proportion of arsenate of lead for control of insects.

9. As the owner of a 20-acre apple orchard, as well as having been directly in charge of our department's spraying experiments in southeastern Ohio, I repeatedly have been asked this question: "Considering the results of all that you have observed from use of many kinds and strengths of sprays during that recent five-year term of experiments, what do you use in spraying your own orchard?"

The Use of Dry Lime-Sulphur

This is a good, fair and reasonable question, and I am willing to answer it: While our department's special spraying tests were in progress in two or more southern counties of our state, involving many spray formulas used on numerous, relatively small plots of trees of Rome Beauty and Ben Davis varieties, a separate, unofficial but equally careful and thorough test was being conducted under my instructions and occasional supervision, by the foreman of our Dale View Orchards in central Ohio. This spraying test was confined to a single formula which, very early in our departmental work in southeastern Ohio, was suggested to me by what I observed, first, of the remarkable efficiency of dilute sprays very thoroughly applied; and, second, of the very promising possibilities of dry lime-sulphur, hydrated lime and powdered arsenate of lead. In addition to this promptly conceived belief that the elements just named would give us satisfactory results in growing healthy trees and producing sound

Results of Spraying and Dusting for the Year 1926, at Vincent, Ohio

	First grade. %	Second grade. %	Third grade. %	Fourth grade. %
Home-mixed dust—				
(1) 90–10 sulphur–lime in the pink	....	...	...	...
(2) 90–10 sulphur–lead in the open calyx	....	...	...	...
(3) 90–10 sulphur–lime 1 week after bloom	....	...	...	...
(4) 90–10 sulphur–lead 2 weeks after bloom	97.5	2.1	0.3	0.0
(5) 90–10 sulphur–lime 3 weeks after bloom	....	...	...	...
(6) 90–10 sulphur–lead in July	....	...	...	...
Factory-mixed dust—				
(1) 80–20 sulphur–lime in the pink	....	...	...	...
(2) 80–10–10 sulphur–lime–lead in calyx	....	...	...	...
(3) 80–20 sulphur–lime 1 week after bloom	....	...	...	...
(4) 80–10–10 sulphur–lime–lead 2 weeks after bloom	84.9	10.2	4.3	0.2
(5) 80–20 sulphur–lime 3 weeks after bloom	....	...	...	...
(6) 80–10–10 sulphur–lime–lead in July	....	...	...	...
Home-mixed dust—				
(1) 20–80 copper–lime in pink	....	...	...	...
(2) 20–70–10 copper–lime–lead in calyx	....	...	...	...
(3) 20–80 copper–lime 1 week after bloom	....	...	...	...
(4) 20–70–10 copper–lime–lead 2 weeks after bloom	90.9	4.2	4.5	0.1
(5) 20–80 copper–lime 3 weeks after bloom	....	...	...	...
(6) 20–70–10 copper–lime–lead in July	....	...	...	...
Factory-mixed dust—				
(1) 20–80 copper–lime in pink	....	...	...	...
(2) 20–70–10 copper–lime–lead in calyx	....	...	...	...
(3) 20–80 copper–lime 1 week after bloom	....	...	...	...
(4) 20–70–10 copper–lime–lead 2 weeks after bloom	93.4	4.6	1.7	0.1
(5) 20–80 copper–lime 3 weeks after bloom	....	...	...	...
(6) 20–70–10 copper–lime–lead in July	....	...	...	...
Check—No spraying or dusting	1.7	36.7	58.8	2.6
Sprayed with dry lime-sulphur and hydrated lime—				
(1) 3 lb. dry lime-sulphur and 5 lb. hydrated lime to 50 gal. water in pink	....	...	...	...
(2) 1½ lb. dry lime-sulphur and 5 lb. hydrated lime in open calyx (plus 1¼ lb. lead arsenate)	98.8	0.7	0.4	0.0
(3) Same formula as in (2)	....	...	...	...
(4) Same formula as in (2) and (3)	....	...	...	...

fruit, the idea of using dry materials exclusively appealed to me very favorably. For we had experienced quite enough inconvenience, expense and unpleasantness in transporting over nine miles of hilly, rough and often muddy roads, heavy casks of liquid lime-sulphur, and of providing storage space for these usually leaking, smelly barrels.

The formula for use of these dry materials, at Dale View Farm, from the very outset up to the present time, is as follows: Three pounds of dry lime-sulphur and five pounds of high grade hydrated lime to 50 gallons of water for the pre-bloom spraying. Then, for all of the after-bloom applications including that in the open calyx immediately following petal-fall, one and one-half pounds of dry lime-sulphur, five pounds of hydrated lime and one and one-fourth pounds of powdered lead arsenate to each 50 gallons of water.

This simple and inexpensive spray formula, strange to say, in comparison with dozens of others used in our southeastern Ohio spraying experiments, is the one that has created more interest and more rapidly gained favor among our apple growers, than any of the entire list. It is being used with fine results at several of our county experiment farms, and tested with equal satisfaction by a number of private orchardists in Ohio. We even have received good reports concerning its adoption and use from several other states.

10. Another and tenth object lesson that our recently concluded spraying experiments by all means should teach us is that, never again, as during the period of comparative inactivity in experimental spraying intervening between the years 1914 and 1922, should we permit ourselves to accept as conclusive and unimprovable any particular system, method, material or conception as relating to ways and means of meeting our many and widely varied problems as growers of fruit products. For we should fully realize that we are living in an age of progress—rapid, eventful, full of surprises. Whether we be privates or professionals in our chosen callings, we cannot safely cling to old "fogey" notions and practices. If we persist in so doing we shall surely lose our occupational footing and be trampled into mediocrity by the pressing onward of those who are determined to discover new and better ways of doing things.

Dusting Experiments Conducted

Whether the marked changes in ideas and practices coming about in spraying, within recent years, has had anything to do with reawakening and intensifying within the minds of our orchardists interest in and desire to know more about the actual possibilities of dusting orchards, we cannot be certain. I suspect that this has been the case. Anyway we of the horticultural department of the Ohio Experiment Station find ourselves in a position to know that something has happened in this respect. For, through unanticipated and surprising action of the membership of the Ohio State Horticultural Society, at the annual meeting of February, 1926, there was a resolution offered, passed unanimously, and forwarded by Secretary Beach to the Ohio Experiment Station, petitioning that dusting experiments be included with the work of spraying tree fruits by the horticultural department of the Ohio station.

This petition of Ohio orchardists was favorably acted upon by Director Williams, of our experiment station, and the spring of 1926 found our department officially commissioned and fairly well equipped with machinery and materials, to undertake orchard dusting experiments. And Mr. Lewis and I, as the field workers upon whom this new work would devolve, were both willing and determined to see what the results of careful, thorough dusting might prove to be.

Two apple orchards were secured for these new projects of dusting in comparison with spraying, near the villages of Vincent and Layman, central Washington county, in the southeastern quarter of our state. On account of having borne a very heavy crop of fruit in the preceding season of 1925, the part of the orchard at Layman, which was set aside for dusting tests, failed to bloom, hence produced no results except so far as the clearly beneficial effects of dusting in control of diseases of foliage were concerned.

Fortunately, however, the 30-year-old Rome Beauty apple orchard near Vincent, which had produced a generous crop of very scabby fruit and equally scabby foliage in the preceding season of 1925, bloomed again rather freely in the spring of 1926, and set a fairly good crop of fruit. This orchard, which had not been pruned for a number of years, presented conditions under which both dusting and spraying would be subjected to extreme tests, so far as prevention of apple scab and the work of insect pests were concerned. The trees were very dense in growth, their centers and lower hemispheres being practically inaccessible to sunshine.

Dusts Prove Effective

Nevertheless, in this orchard, in 1926, was very clearly demonstrated for the first time in Ohio the fact that results of thorough dusting with approved dust formulas are creditably comparable with those of equally careful and thorough spraying with our more dependable spray formulas. Moreover, this first season's work in the new project rather clearly indicated that there still remained to be learned many points of interest and value in relation to the use of orchard dusts of considerably modified formulas.

To those who are not familiar with Ohio apple grading regulations it may be well to explain that, so far as commercial grades are concerned, both the first and second classes above recorded would be included in our excellent marketable stock designated as "Buckeye Brand A."

(Note.—In the May issue Prof. Ballou will give the results of spraying and dusting experiments in central and eastern Ohio for the year 1927.)

ECONOMY

ECONOMY gets right down to dollars and cents. When economy goes beyond initial price and makes itself felt in operating and maintenance costs throughout a long truck life, it points the sure road to profits.

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Chats with the Fruit Grower's Wife

Popular Recipes Embodying the use of Canned Fruits and Jellies in Tasteful Dishes. Flowers and Flower Garden Plans for the Month of April.

By Hazel Bursell

Fruit Recipes

All Measures Level.

RICE BAVARIAN CREAM WITH APPLES

(Six Servings)

1 level tablespoon gelatine
½ cup cold water
¼ cup sugar
¼ teaspoonful salt
1 cup cooked rice
1 cup cream, or evaporated milk
1 teaspoon vanilla

Soak gelatine in cold water 5 minutes and dissolve over hot water. Add to hot rice and sugar, salt and vanilla. Beat well, cool, and when it begins to thicken,

add whipped cream. Turn into wet mold. Serve with sliced apples and a chocolate sauce.—(Courtesy Charles B. Knox Gelatine Company, Inc.)

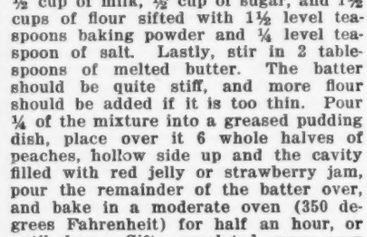
CANNED PEACH PUDDING

Put six large halves of canned peaches through a colander, add I beaten egg, ½ cup of milk, ½ cup of sugar, and 1½ cups of flour sifted with 1½ level teaspoons baking powder and ¼ level teaspoon of salt. Lastly, stir in 2 tablespoons of melted butter. The batter should be quite stiff, and more flour should be added if it is too thin. Pour ¼ of the mixture into a greased pudding dish, place over it 6 whole halves of peaches, hollow side up and the cavity filled with red jelly or strawberry jam, pour the remainder of the batter over, and bake in a moderate oven (350 degrees Fahrenheit) for half an hour, or until done. Sift granulated sugar over the top, and set under the gas flame or on the top shelf of the oven until the sugar is melted and turns brown.—(Courtesy Calumet Baking Powder Company.)

BISCUIT TARTS

2 cups flour
3 teaspoons baking powder
½ teaspoon salt
1 tablespoon sugar
1 egg
2 tablespoons shortening
⅓ cup milk

Sift together flour, baking powder, salt and sugar; add well-beaten egg and melted shortening to milk and add to dry



ingredients to make soft dough. Roll out on floured board, ⅛-inch thick. Cut out with medium size biscuit cutter which has been dipped in flour. Then, taking a smaller cutter, cut one-half of these rounds again. Brush the large rounds lightly with melted butter. Then take the outer rings and lay on top of the large buttered rounds. Put on greased baking tin. Put a teaspoon of jam in each tart and bake in hot oven, 475 degrees Fahrenheit for about 10 minutes. The small centers can be brushed with butter and baked in the same manner and served as little tea biscuits. Make 10 tarts with 10 tiny biscuits.—(Courtesy Royal Baking Powder Company.)

APPLE AND ORANGE SQUARES

(Six Portions)

1 package orange gelatine
1 cup boiling water
1¼ cups cold tart apple sauce

Dissolve orange gelatine in boiling water. Add the cold apple sauce and

pour into a mould or shallow pan and chill until firm. Cut into squares and serve with top milk or cream. This is a new and delightful way to serve apple sauce and is especially popular with children.—(Courtesy Royal Baking Powder Company.)

PRUNE PERFECTION

(Eight Servings)

1 package orange gelatine
1 pint boiling water
1 pound prunes, dried
1 cup sugar

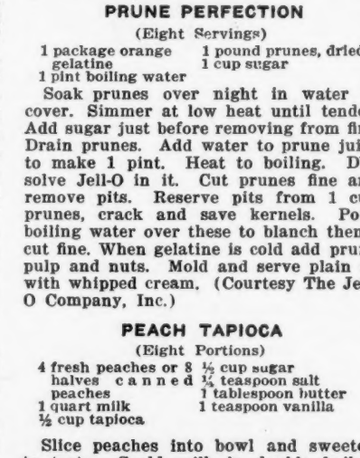
Soak prunes over night in water to cover. Simmer at low heat until tender. Add sugar just before removing from fire. Drain prunes. Add water to prune juice to make 1 pint. Heat to boiling. Dissolve Jell-O in it. Cut prunes fine and remove pits. Reserve pits from 1 cup prunes, crack and save kernels. Pour boiling water over these to blanch them; cut fine. When gelatine is cold add prune pulp and nuts. Mold and serve plain or with whipped cream. (Courtesy The Jell-O Company, Inc.)

PEACH TAPIOCA

(Eight Portions)

4 fresh peaches or 8 halves canned peaches
1 quart milk
½ cup tapioca
½ cup sugar
¼ teaspoon salt
1 tablespoon butter
1 teaspoon vanilla

Slice peaches into bowl and sweeten to taste. Scald milk in double boiler. Add tapioca, sugar, salt and butter and



cook 15 minutes, stirring frequently. Remove from heat, add vanilla and pour over fruit. Chill and serve in sherbet glasses. Garnish with sweetened whipped cream and sliced peaches. (If canned peaches are used, less milk is needed as any available fruit juices may be used to make up the quart of liquid. Also, it is unnecessary to sweeten peaches in bowl.)—(Courtesy Minute Tapioca Company.)

Stimulating the Demand for the Fruits We Raise

INCREASED consumption of the fruit we raise is a real live issue to every member of the fruit grower's family. And every movement that helps to educate the general public as to the uses of fruit in every-day foods is sure to win our interest. I wonder if any of us can realize to what extent the use of fruit is being encouraged and promoted by the large national advertisers — the manufacturers of cereal foods, baking powders, gelatine and the like? Many of these concerns, all of the larger ones, have "Educational Departments," usually in charge of trained dietitians, who have in charge the work of disseminating information on the preparation of tasteful and nutritious dishes in which the manufacturer's product is used. In training, every student of diatetics receives as part of her education a thorough knowledge of the value of fruit as a food. Thus it is but natural that in the literature issued by the concerns employing dietitians that fruits will be prominently featured. This is also reflected in their advertising matter. One of the largest cereal manufacturers, in its advertising, has within the past year recommended a variety of fruits in *over six million colored pieces of publicity!* Other concerns are doing work of a similar nature in their educational literature. On this page this month, we are giving a few of these recipes, with the permission of the manufacturers. Aside from the value of these recipes in adding to our store of tasteful dishes, they have an especial interest to us in the effect their wide publication has on the greater use of the fruits we raise.

Plant Annual Flowers This Month

THE BEST TIME to start a flower bed is early in the spring, as most seeds germinate best during the moist spring weather. Early sowings also give earlier and longer seasons of bloom, but, even so, with a little extra care, anyone can have a fine display in the flower garden from plantings made as late as June 1. However, the very best time to sow the seeds of annual flowers is in April and May. The exact date will depend on local weather and soil conditions. All danger from frost should be past before planting outdoors in the garden, and the soil should be sufficiently dry to pulverize easily when spaded and raked for the seed bed. There are certain plants, however, which make their greatest growth and bloom most profusely when planted even earlier, as in March, in cold-frames, hot-beds, or in boxes in the house. There are some plants which *must* be started indoors or in hot-beds in order to insure germination.

Annuals which must be sown indoors or in hot-beds for good results include canna seed, coleus, gloxinia, lobelia, cardinal climber, dahlia seed, moonflower, lantana, amaryllis begonia, tritoma (red-hot poker plant), and flowering tobacco.

Other plants which can be started from seed in outdoor seed beds later, but which will make their best showing if started indoors or in hot-beds include salvia, snapdragon, morning-glory, clarkia, stocks, heliotrope, ageratum, aster, petunia, carnation, pansy, phlox, iris, centaurea (thistle flower), and verbena.

Sweet Peas and April Annuals

SWEET PEAS are annuals, but they come in a class by themselves. They may be planted in a two-foot deep trench the preceding fall and covered over lightly with soil and leaves, the trench being left open throughout the winter. The pea seed will germinate and form a small growth in the fall, form roots during the winter, and then be ready for a strong, rapid growth in the spring. The trench should be gradually filled in around the plants as they grow towards the top. This planting makes for a deep root system and insures a long blooming season. For spring planting, the seeds should be started indoors in boxes in a warm, light room, then, as soon as the plants show green above the soil, the box should be placed in a cooler, darker place so the plants will develop good roots. The trench should be prepared as early as possible and left open to the weather until the sweet peas are ready for transplanting. When sufficiently developed, the young seedlings should be planted in the trench in a rich soil, and the trench should be filled gradually as growth warrants. Sweet peas with a deep root system will produce larger blossoms and will bloom all summer without drying out.

Annuals which may be planted after danger of frost is passed in seed beds in the open as early as April with uniformly good results are candytuft, forget-me-not, cosmos, [*To Next Page*]

four-o'clock, flax, canary bird flower, periwinkle marigolds, sweet alyssum, portulaca, phacelia, oxalis, mignonette, zinnia, love-in-a-mist, larkspur, stock, salpiglossis, spider plant, nasturtium, gaillardia, godetia, California poppies, poppies, and balsam.

Certain of the above plant seeds should be sown where the plants are to remain due to ease in germination, to the delicate structure of the plant, or to the possession of a tap-root system such as poppies have. These are phacelia, portulaca, periwinkle, (Vinca), love-in-a-mist, candytuft, sweet alyssum and all types of poppies.

In many cases the flower lover will have to purchase seed only once for a given flower. Certain plants can be counted on to seed themselves or to produce roots or tubers which will carry on the line. Plants belonging to this class include lily-of-the-valley, candytuft, foxgloves (digitalis), love-in-a-mist, four-o'clocks, nasturtiums, sweet Williams, daisies, larkspur, canterbury bells, and usually wall flower, columbine, and sweet alyssum. Dahlias and cannas grown from seed raise tubers during the year to perpetuate the species. In addition, seed may be saved from nearly every annual for next year's planting.

Certain especially tender flowers should not be planted until May, when the nights have become reasonably moderate. All annuals mentioned under April may still be planted during May, and even in early June. The May group includes baby's breath, balloon vine, begonia, burning bush, blue lace flower, blue-eyed African daisy, feverfew, flowering tobacco, strawflowers, tritoma, tuberose and vinca.

Perennials in June

While this plant division may not properly come under the heading of "annuals," we believe it is important to mention the planting of perennials from seed. Authorities on flower gardening say that June is the ideal month for sowing perennial seeds for next year's plants. These should be planted in a special seed-bed in which the plants may remain and make a fast growth until they are ready for transplanting to the permanent place in the latter part of August or September. (The latter month is really preferable for transplanting.) Perennials which will prove worth while additions to any garden include delphiniums, columbine (both the common and hybrid long-spurred varieties), sweet William, dianthus (spice pinks), pentstemon, lupine, perennial poppies, perennial phlox, tritoma, anemones, wall flowers, carnations, peonies, and bleeding hearts.

Perennials are the real "backbone" of every worth while garden. They insure quantity and variety of blooms without additional labor after the first year. All they need in order to reward you with marvelous blossoms at their respective seasons is good soil and sufficient water. Each year they increase in size, beauty and value. They are the only means, outside of certain bulbs, of providing blooms for the early spring, during that period before the annuals come on, which would otherwise be flowerless.

The way to acquire a delightful collection of perennials when time and space are limited, is to plant three or four kinds each year until the desired types have all been secured. Begin with sweet Williams, perennial phlox and columbine, say, then add wall flowers, delphiniums and spice pinks the next year, and so on year after year.

Soil Preparation Important

The proper preparation of the soil for seed planting is a most important factor in the ultimate success of the flower garden. If the seeds don't germinate properly, you will not have sufficient plants to fill the desired space. If the young plants don't make a rapid, healthy growth from the start they never will measure up to standard no matter how much care may be lavished on them later.

A reasonably rich, sandy soil should be used for the indoor boxes. Seeds should be scattered well, and covered lightly, the depth usually increasing with the size of the seeds. Hard-shelled seeds, such as morning-glories, moonflowers and sweet peas, will germinate much more readily if soaked in warm water until the shells crack before planting in the soil. The boxes should be kept moist and placed in a warm, light room until the plants show green above the soil. Then they should be taken to a cooler, darker room, but still be kept moist while the roots develop. Farm gardeners are all familiar with the handling of hot-beds and cold frames so that need not be gone into here.

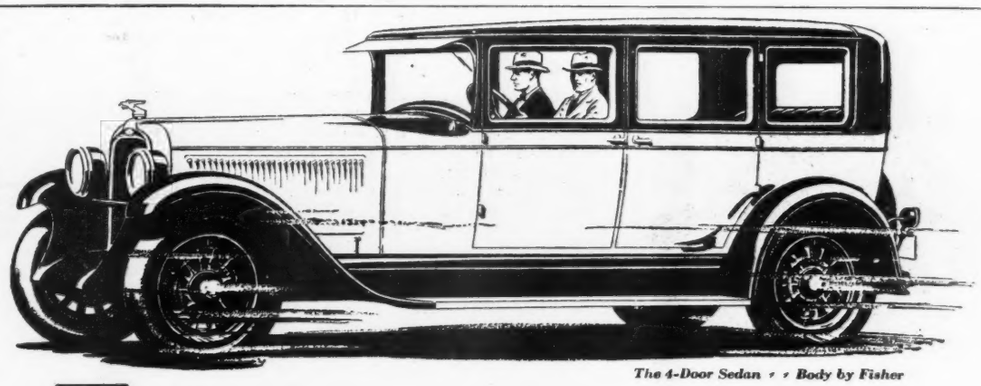
For the outdoor seed beds, the garden should be spaded and worked down with the rake and hoe until the soil is even and fine. If the soil is inclined to be heavy, the addition of sand or ashes or both, will make it lighter and, at the same time, improve the soil permanently. Pulverized, well-rotted manure should be worked into the soil of the seed beds. Then the bed should be staked off into "plats" for the various types of plants, each plat should be carefully marked as to the type planted therein and finally the seeds should be scattered evenly and thinly in the various plats. They should be covered lightly by hand, and then sprinkled gently with water so as to soak the seed bed without packing the soil or disturbing the seeds. The plats should be kept reasonably moist until germination takes place, and should be sprinkled thereafter the same as for any other growing plants. Certain seeds need a wet sack placed over them as an aid to germination. Just as soon as the young plants are large enough, they should be transplanted to their permanent locations, as they will soon "stunt" if left too long in the close quarters of the seed bed.

Move Young Plants

The transplanting should be undertaken on a cool, cloudy day if possible. As much dirt should be left on the roots as will cling to them from the seed beds, so that the plants will be disturbed as little as possible. Transplanting when the plants are fairly small also helps along this line. The roots of the plants should be "puddled" in with water to bring the soil close against the roots, and then dry soil should be filled in on top.

The annuals and also the perennials

(*Continued on Page* 35)



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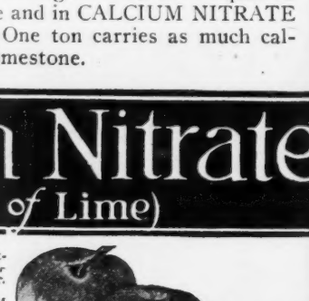

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The Market Review

By PAUL FROEHLICH
United States Bureau of Agricultural Economics

HIGHER and higher goes the price of apples and oranges. At the present level, growers who held their fruit evidently are having exceptionally satisfactory returns, all on account of the relatively light supply of eastern apples and Florida oranges. In contrast with the early season last year, strawberry movement seems late, but shipments will soon be very active. Market prospects for tree fruits favor a good wind-up of the season. Whether strawberry growers will receive as much in the aggregate as they did last season is questionable. Cool weather in the South has retarded fruit trees to a desirable degree.

Foreign Markets for Apples

British markets this year appear to have favored barreled apples in preference to boxed stock. Virginia Albemarle Pippins and York Imperials were averaging close to $9 per barrel on the Liverpool auction in early March. Some sales were made above $9 and a few lots approached $11. Badly scalded fruit, of course, was heavily discounted. Extra Fancy Yellow Newtowns, from Oregon, brought around $4 per box. Prices of other northwestern varieties also were advancing.

With heavy cargoes of New Zealand and Australian apples afloat for the United Kingdom, competition will soon be severe. By mid-April, it is expected that twice as many apples as last year will be available from these countries. Crops were light last season, but this year Australia and New Zealand probably will have for the export trade 3,600,000 boxes of apples and 370,000 boxes of pears. Supplies in British markets will be more like those of 1926. Arrivals of South African peaches, plums, pears and grapes recently have been attracting attention of fruit dealers away from apples and oranges, though the supply of Spanish oranges and Jaffa oranges is still heavy. Florida grapefruit has been in demand lately at $7 per box.

German markets for American apples were not showing the strength desired by shippers. There was still considerable competition from Continental fruit and from the large receipts of oranges. Arrivals of apples from the United States have been only about one-third those of last season. Surprisingly heavy quantities, however, were coming from Holland and from other European countries. Australian apples also begin to arrive in April. The Danish market showed an active demand for barrels of eastern Yorks and Ben Davis and boxes of western Newtowns.

Total exports of United States and Canadian apples by the first of March were approximately 1,900,000 barrels and 4,800,000 boxes. This is about 60 per cent fewer barrels and 30 per cent fewer boxes than were exported by the same time last season. Total volume shipped overseas has been out slightly more than half of last year's corresponding record.

Domestic Markets Strong

When it is remembered that for every three cars of eastern apples shipped last spring only one car is available this year, present high prices are easily explained. Values have advanced anywhere from 50 cents to $1.50 per barrel during the past month, the biggest gain appearing from Rhode Island Greenings from New York state. This variety was jobbing at $11 per barrel, with McIntosh slightly higher and Baldwins and eastern York Imperials at $7.50-$8. Shipping points in western New York quoted best Baldwins at $7.50-$8, compared with $3.75 a year ago. Michigan Baldwins touched top of $8.50 in Chicago, while Spys sold as high as $10. Terminal market prices of northwestern Extra Fancy boxed apples ranged $3-$4.75. Winesaps reached top of $2.70 in Washington producing sections. Movement of western fruit during recent weeks has been one-fifth heavier than a year ago, because of the larger quantities held in cold storage at shipping points.

Eastern Holdings Light

Cold storage holdings of barreled apples on March 1 were 61 per cent lighter than a year ago and 66 per cent below the five-year average for March. Only 847,000 barrels remained in commercial cold storage plants, compared with 7,042,000 boxes and 1,530,000 bushel baskets. The supply of boxed apples was just slightly above average holdings for this time of the year and about four per cent less than on March 1, 1927. Nearly two-thirds of the boxes in cold storage were still in the Pacific Coast states. The March holdings of bushel baskets were just about the same as a year ago—possibly 120 carloads less. Reduced to a comparable basis, total cold storage supplies of apples were 28 per cent below the total of last spring and 23 per cent less than the average March figure for the past five seasons. It looks as if the remaining supply of barreled stock will be cleaned up exceptionally early. In that event, the market for boxed apples may show added strength.

Five-Dollar Oranges

At the opening of the season last fall, few persons probably thought that Florida oranges would be bringing as much as $5.75 per box, f. o. b. shipping point. Best Valencias recently have sold at that price, and other varieties ranged up to $5. Desirable sizes of Duncan grapefruit were bringing $3.75-$4, with Marsh Seedless commanding a premium of 25 cents. Local estimates as to remaining shipments are 3000 cars of oranges and 4000 cars of grapefruit after March 1, or about half as many as last spring.

One of the leading firms shipping Florida citrus has figured that this season's crop will return growers in that state about $50,000,000. Two-thirds of the total can be credited to oranges and tangerines, and the rest to grapefruit. Possibly $15,000,000 of this total will be distributed for labor and material furnished in Florida in the way of picking, hauling, packing and marketing, as well as the use of capital in financing the industry. This means an average return of $2 or more per box. Some growers will not do as well as that but others may exceed the average. The California orange crop also is considerably lighter than last season, and the estimated gross returns to growers are about $68,000,000 for the 1927-28 season. The bumper California crop of last season was valued at $86,000,000.

Weekly shipments of grapefruit have been averaging about one-third less than last winter, and oranges about one-fifth less. By early March, Florida and California together had shipped approximately 29,000 cars of oranges, as against 34,000 by the same date last season. Output of Florida grapefruit exceeded 9000 cars, compared with 10,500 by March 1, 1927. Mixed citrus shipments from Florida were around 5000 cars, which was 1500 more than to the same time last year.

Canned and Dried Fruit

Figures of the Department of Commerce show that, during the six months ended last December, exports of canned goods and dried fruits amounted to $51,400,000. This would be at the rate of $100,000,000 annually, and is in addition to the vast quantities of these products consumed within the United States. Commenting

on these figures, a leading commercial journal said:

"The report of the Department of Commerce shows that the goods exported include meat, milk, fruit and vegetables. Dried fruits also are included in the total. Fruits and vegetables make up the greater part of the exports. Notwithstanding the fact that our exports of fresh fruit are growing larger, the trade in canned and dried fruits is becoming more and more important. The greater part of these exports is of soft fruits, peaches, apricots and others that would not stand shipment like apples and oranges. Among the dried fruits, prunes and raisins are in the lead. It is worthy of note that, with the exception of dates and figs, the United States is the world's greatest producer of dried fruits. It produces 90 per cent of the world output of dried peaches, apricots and apples, 70 per cent of the prunes, and 50 per cent of the raisins. As 90 per cent of this output comes from California, the figures reveal another industrial opportunity for Florida. That state with all its opportunities for raising fruit and vegetables, holds practically none of the tin-can and dried-fruit trade in the international market. And yet the demand from foreign countries is rapidly increasing. In the five-year period preceding the war, the exports of dried fruits from the United States averaged 200,000,000 pounds a year. In the second half of 1927 they were 339,577,000 pounds. Here is an expansion that should attract all those who are so situated as to produce those commodities. This is a hungry world, and the tin can and evaporator open up great possibilities for producers to satisfy that hunger and profit thereby."

The German market recently has been particularly active on dried prunes. Just before the reduction of the import duty, effective last December 20, stocks were nearly exhausted. Prices at Hamburg by the end of January had advanced to $7.25 per 100 pounds of 30-40 size prunes and to $4.40 per 100 pounds of the 100-120 size.

Strawberries Moving

The Louisiana strawberry season opened much later than last year, but movement will soon be heavy. First cars in 1927 rolled as early as February 24. With Florida's production only about half as heavy as last season, carlot output of that state by the first part of March was about 90 cars, compared with 290 the year before. Jobbing prices in city markets were fast declining to an average of 50 cents, quart basis. By this time last year several strawberry states were quite active, including Florida, Louisiana, Alabama and Texas, but movement from all commercial sections this season will begin nearer the normal date.

Supreme Court Decision Important to Co-operatives

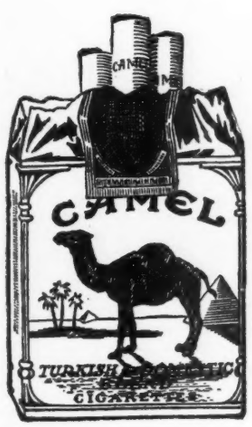
FEDERAL and state laws declaring expressly or in effect that farmers' co-operative associations shall not be deemed monopolies, combinations, or conspiracies in restraint of trade, and that contracts made by such associations with their members are legal, are upheld at least by implication by the Supreme Court of the United States in a decision handed down February 20 in the case of the Liberty Warehouse Company versus The Burley Tobacco Growers' Co-operative Marketing Association.

This decision, says Secretary of Agriculture Jardine, is of far reaching importance because, in addition to validating Kentucky's co-operative marketing laws, it virtually upholds the Federal Capper-Volstead Act, section five of the Clayton Act, and the co-operative marketing statutes passed in 42 states. In the Kentucky case judgment was affirmed against a warehouse company which bought tobacco from a member of the Burley association, after being notified that delivery of the tobacco to it would constitute a violation of the member's co-operative contract.

Co-operative marketing acts, the United States Supreme Court indicated, promote the common interest, and provisions for protecting the fundamental contracts against interference by outsiders are essential to the plan. In the suit against the Liberty Warehouse Company, the Burley association, which was incorporated under the Bingham Co-operative Marketing Act of Kentucky, recovered a penalty of $500 prescribed by the act, because the warehouse company received and sold 2000 pounds of the 1923 tobacco from a member of the Burley association, although its attention had been called to the penalty provided for such action. This measure authorizes associations formed under it to recover the penalty mentioned "from any person, firm, or corporation conducting a warehouse within the state of Kentucky who solicits or persuades or permits any member of any association organized hereunder to breach his marketing contract with the association by accepting or receiving such member's products for sale or for auction or for display for sale contrary to the terms of any marketing agreement with an association." The association was successful in the lower court, and also when the case was appealed to the Court of Appeals of Kentucky.

In upholding the judgment, the United States Supreme Court declared the state of Kentucky undoubtedly had power to authorize the formation of corporations with membership limited to farmers for the purpose of dealing in farm products. The Warehouse company contended that the Bingham Act deprived it of the right to carry on business in the usual way by accepting and selling the tobacco of persons voluntarily seeking its services. Commenting on this contention, the United States Supreme Court said: "We need not determine whether the liberty protected by the constitution includes the right to induce a breach of contract between others for the aggrandizement of the intermeddler—to violate the nice sense of right which honorable traders ought to observe."

If you smoke for pleasure



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Pipe-loving Doctor Re-discovers His Favorite Tobacco

Tempted to change his brand, one whiff from another's pipe makes him stick to his good old standby

Just as the grass looks greener on the other side of the fence, smokers sometimes think the other man's tobacco smells sweeter than their own.

Recently a Charleston optometrist found himself enticed from the fold, only to discover that his old favorite had led him astray:

Charleston, W. Va.,
March 4, 1927.

Larus & Bro. Co.,
Richmond, Va.

Gentlemen:

Recently I stopped in a little village that consisted of about nine houses and a small hotel, which I entered.

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I began with: "I beg your pardon, sir, but I came in to buy a can of tobacco, and I would like the same brand you are smoking if you don't mind telling me." He looked at me for a moment, grasped his pipe with one hand and said: "I'm smoking Edgeworth. Would you like some?"

Of course I did, and I secured a supply from the old fellow. The joke, of course, was on me, but I went on my way rejoicing.

Yours very truly,
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To those who have never tried Edgeworth, we make this offer:

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Write your name and address to Larus & Brother Company, 13 S. 21st Street, Richmond, Va.

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Edgeworth is sold in various sizes to suit the needs and means of all purchasers. Both Edgeworth Plug Slice and Edgeworth Ready-Rubbed are packed in small, pocket-size packages, in handsome humidors holding a pound, and also in several handy in-between sizes.

To Retail Tobacco Merchants: If your jobber cannot supply you with Edgeworth, Larus & Brother Company will gladly send you prepaid by parcel post a one- or two-dozen carton of any size of Edgeworth Plug Slice or Edgeworth Ready-Rubbed for the same price you would pay the jobber.

[*On your radio—tune in on WRVA, Richmond, Va.—the Edgeworth station. Wave length 254.1 meters. Frequency 1180 kilocycles.*]

Training and Pruning Brambles and Bush Fruits

That Pruning of the Small Fruits—The Brambles and Bush Fruits—is an Operation that Pays good Dividends, may be best judged from the fact that a Crop Increase of as much as 30 Per Cent is not Unusual, as a Result of Intelligent Pruning.

By A. S. Colby
University of Illinois

COMPARATIVELY little time is spent in the ordinary small fruit garden in pruning and training bush fruits and brambles. They are allowed to grow up too thick and rank, to the detriment of the future crop. It has been shown, however, that proper pruning and training increases the quantity of the fruit by as much as 30 per cent, and that the quality is also improved.

Pruning and Training Defined

While the two terms are often used interchangeably and are often misunderstood, there is a distinct difference between them. Pruning is defined as the removal of some part of the plant. Training is defined as the exposure in some definite manner of the various parts of the plant above ground. Pruning is in effect a thinning process. It has been said that training regulates the plant while pruning regulates the fruit. As a rule, the bush fruits and brambles are pruned in such a way that they require no support to be trained upon. Exceptions include the trailing brambles, such as Loganberries and dewberries, and, in some instances, raspberries when allowed to grow very vigorously.

Pruning is practiced to keep the plants opened up to light and air, to reduce competition through the cutting out of surplus plants in and between the row, and to make the seasonal operations of cultivation, disease and insect control, and picking easier.

To prune intelligently, one must know the growth and fruiting habits of the kinds and varieties concerned. One should also know the most favorable time to prune and have on hand the correct tools. Pruning shears and pruning hooks of only the best steel should be considered. An acquaintance with the soil treatment being followed in plantations where the pruning is being done is necessary in order that the correct amount of fruiting wood be left.

Training and Pruning Currants and Gooseberries

Currants and gooseberries are usually trained to the bush form rather than the tree form; hence they are commonly called bush fruits. They bear their fruit just at the base of the previous season's growth or on short spurs on older wood. These spur-like growths are comparatively short-lived. The best fruit is borne on wood not over three years old.

Warm, pleasant days in early spring offer the best time for pruning the bush fruits. Annual pruning is best. If the bushes are regularly cared for, it will be necessary to cut away only the oldest wood, leaving about six to eight yearling shoots well distributed over the bush each season. These shoots are gray in color and usually straight with no lateral growths. Wood from one to three years old will then be left. This will bear as much fruit as the plant can mature properly. Vigorous, well-cared-for plants may be allowed to retain a small amount of four-year-old wood.

If the plants have been neglected for several years, little yearling wood will be found. The bush will be filled with old, dead canes. The annual growth at the ends of the shoots will be weak and the fruit will be poor in quality and small in size. The oldest wood should be removed and the bushes opened up to light and air. If they are well fertilized, and sprayed to rejuvenate them, good crops may be expected again.

Gooseberries are more vigorous growers than currants, tending to branch laterally on terminal growth of the same season. This habit of growth makes for a compact bush. More wood must, therefore, be cut away from gooseberries to keep them open. Few gooseberry plants are pruned severely enough.

Pruning the Brambles

Raspberries and blackberries are plants with more or less perennial roots and with biennial tops. The fruiting cane which will bear fruit in 1928 grew in 1927. The fruiting cane which grew in 1926 bore fruit in 1927 and then died.

Pruning the blackberry as a rule involves (1) the removal of the dead canes as soon as convenient after they have borne fruit in summer; (2) the thinning out of surplus plants and the cutting back of those remaining in the plantation during the dormant season; and (3) the tipping of the young growing shoots in spring as they reach a height found best for the particular locality, usually about 20 inches to two feet.

Blackcaps and purple canes are handled in much the same manner as blackberries. Red raspberries should not be tipped in late spring.

We have found in Illinois that blackberries should remain about a foot apart in the row after the winter pruning is completed. Better crops of quality fruit are produced where comparatively severe pruning is practiced. The laterals on the remaining canes are cut back one-half. Slightly more fruits are produced if they are not cut back so severely, but the quality and size were found to be inferior from experimental work carried on at the Illinois Agricultural Experiment Station.

Tipping of the young blackberry canes is done twice, at about two-week intervals in spring, in order to get the majority of the shoots as they reach a height of about 20 to 24 inches. This operation induces lateral branching and makes for stocky, tree-like growth.

Black raspberries are grown in hills rather than in hedgerows. The number of canes to leave in each hill will vary, depending upon the vigor of the variety and the type of soil. If the plants are small, only a few canes should be left when the dormant pruning is done. Large plants in good soil can support four to six canes each. In any case the laterals should be cut back severely.

It was formerly thought good pruning practice to shorten the laterals back to a length of 12 to 18 inches only. Recent experimental work at the Michigan station, however, indicates that on their type of soil, much more severe pruning is more profitable. They recommend cutting back the laterals to four or five inches in length. This treatment results in an improved grade of berry, with larger size. The total yield is, therefore, increased. The first picking is relatively heavier on such plants and the pickings are more uniform. Less time is required to harvest the crop under such conditions. It is also pointed out that such short pruning is an insurance, in that the berry grower often encounters hot, dry weather with consequent loss in production if the plants are carrying too many fruit buds.

Red raspberries are grown either in hedge rows or in hills. The hill method is being quite extensively used with such vigorous varieties as the Latham. Where the hedge row method is practiced, dormant pruning consists in (1) removing the dead canes which bore fruit the previous season; (2) cutting out the surplus yearling canes so that the largest and strongest are left, these being spaced about 12 inches apart in the row; and (3) cutting back those which remain to a height of from three to five feet, depending upon the variety and the soil conditions. Red raspberries are not tipped in the spring.

Where the raspberry is grown in hill form, some support is used. One or more stakes are driven in beside the plant and the plant tied to the stake. In sections where grass-hoppers are likely to be common, it has been found necessary to use twine impregnated with tar or a similar repellent. From three to six canes are left to the hill at the time of dormant pruning and those remaining are cut back as in the hedge row method.

Disposal of Prunings

After the pruning is done, it is wise to remove the prunings at once from the plantation and burn them as a sanitary measure in the control of insects and diseases, such as tree cricket, rose scale, San Jose scale, and anthracnose.

Petroleum and the Fruit Industry

By J. G. SANDERS

THE REMARKABLE developments of science and industry almost daily furnish unusual and interesting new contacts in the business world. New products are locating markets in unsuspected channels, and there seems no end to the adaptation of industry's output to man's needs.

The fruit grower of 30 years ago never suspected that he or his sons would be dependent on the petroleum industry for success in large orcharding operations. The day has arrived when the horticulturist would be seriously handicapped if all petroleum products were denied him. Gasoline, lubricating oil and grease for sprayers and tractors; fuel oil for orchard heaters in certain spring frost danger zones; oiled paper for prevention of scald in storage apples; and miscible oils and oil emulsions for spraying constitute most interesting developments and adaptations of one of Nature's products.

Orchard heating as an occasional protection against late spring frosts is provided in many sections when valuable crops are subject to frost damage. Particularly in the West, orchard heating with fuel oils or distillates has been adopted widely and profitably.

Gasoline, lubricating oils and greases for power sprayers and dusters have become absolute necessities in orchard

care and fruit protection, without which growers would be seriously handicapped.

Oiled paper wrappers and packing have shown remarkable value in preventing "scald" of apples, particularly certain tender green and yellow varieties, under storage conditions, thereby enhancing their market value and keeping qualities.

A half century has elapsed since a petroleum product, kerosene emulsion, was introduced and recommended by the entomologists of the United States Department of Agriculture for control of certain scale insects. Since that that time, remarkable changes have developed in the manufacture of the many derivatives of petroleum, and certain of these have come into very general use for the spraying of trees, shrubs and plants for ready control of certain pests.

The rapid and serious spread of apple leaf roller into the far western orchards soon forced the growers to use oil sprays at eight to 10 per cent emulsion strength; and fortunately when properly and thoroughly emulsified, these oil sprays have caused no cumulative injury. "Broken down" or separated oil emulsions, often homemade, have occasionally caused serious damage.

About eight years ago a widespread serious infestation of San Jose scale appeared in the Mississippi Valley states which lime-sulphur solution failed to control. Again the miscible oils and oil emulsion saved the orchards, although thousands of trees were on the verge of destruction.

Orchards in the New England states, Nova Scotia, Ontario and several other northeastern states are now suffering much injury from attacks of the European red mite, which damages the foliage, causing a bronzy or sickly condition and interfering with the usual leaf functions.

Miscible oils applied in the delayed dormant stage have given much better kill of the over wintering eggs than the lighter oil emulsions and have come into general use at this stage for the control of scale insects and as a check on aphis as well.

Petroleum miscible sprays seem destined to supplant the old disagreeable caustic lime-sulphur solutions for dormant spraying, while the diluted summer strengths of lime-sulphur as a fungicide are proving efficient.

The home-mixing of oil emulsions is always attended with uncertainties regarding the oil, soap and hard water difficulties and is not generally recommended. A miscible oil made by a reliable manufacturer is usually more dependable and uniform in quality.

In New York "Apples Is Apples"

From a survey of consumer preferences in the New York City market, recently made by the New York Marketing Research Council in co-operation with the Bureau of Agricultural Economics, it was found that the Jewish people were more selective in buying their apples than were the other races, 58 per cent of the Jewish families surveyed preferring the McIntosh as an eating apple as against all the others offered. There are 300 or 400 varieties of apples grown in the United States, but the New York public confines itself pretty much to about 15 of them, and only eight of these 15 seem to be preferred by any considerable numbers of the population, according to the survey. The survey indicated that the citizen of New York is not very much interested in the name of the variety of the apple he eats, but has been buying mainly on the basis of appearance and the recommendation of the retail merchant. It developed in the investigation that only a few consumers knew the difference between eastern and western apples, and that to most housewives an apple was simply either an "eating" or a "cooking" apple. Fifty-one per cent of the housewives interviewed said they could not identify a single variety of apple at the dealer's store.

Artificial Manure From Straw

While the Principal Point of Economy in the Manufacture of Manure by the Process as Described in this Article is Based on the Treatment of Straw as it leaves the Thrasher, Fruit Growers will be able to Adapt the Plan to suit their own Conditions at but a Slight Increase in Expense.

MANURE equal in quality to the best barnyard fertilizer can be made from farm-grown materials and without the aid of horses or other farm animals, according to a series of experiments that have been carried on by the Soils Department of the University of Missouri for the past two years. Ordinary wheat or oat straw is the material, and a simple, inexpensive chemical mixture, combined with rain, is the chief manufacturing agent which changes the straw to manure within two or three months after it is threshed.

The cost of the artificial manure varies between 65 and 85 cents per ton, according to the experiments carried out to date.

The process of making artificial manure has been carried on for two years on the farm of E. M. Poirot, Golden City, Mo., under the direction of Dr. W. A. Albrecht of the Soils Department of the University. The experiment has been such a success that Mr. Poirot is enthusiastic about it as a wise and economical farm practice.

How the Manure is Made

The process is briefly this: A simple chemical mixture of 45 per cent ammonium sulphate, 40 per cent agricultural limestone and 15 per cent superphosphate is mixed with the straw at threshing time at the rate of 150 pounds to a ton of straw. The straw is blown into flat piles not over five or six feet deep in order that it may take up water readily from rains and start the rotting brought about by the chemicals through their effect on the bacteria and molds in the straw. The length of time necessary to change the straw into manure depends on the depth of the piles of straw and the amount of rainfall, as water is a necessary chemical agent in the process of rotting.

(*Continued on Page* 25)

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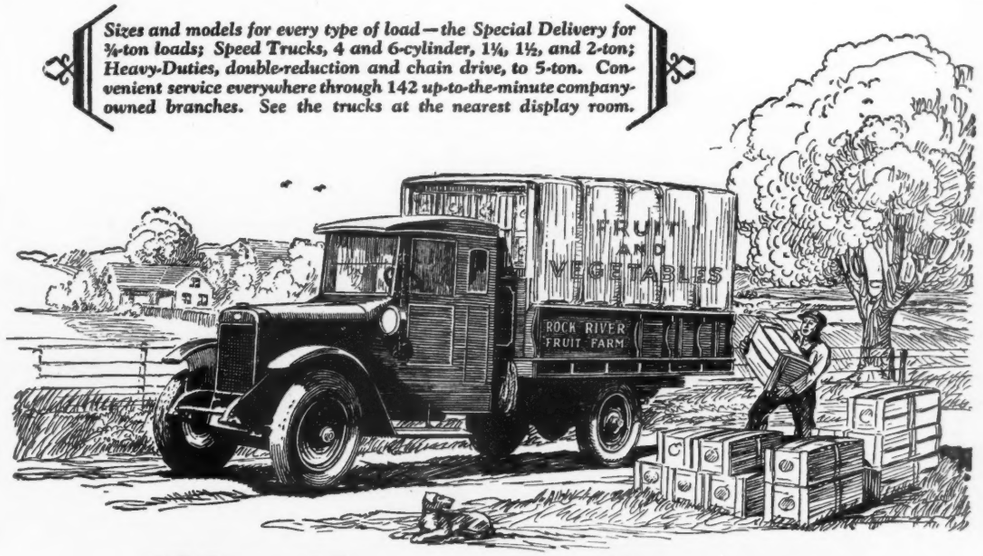

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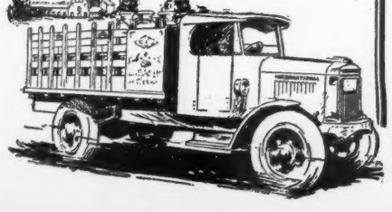

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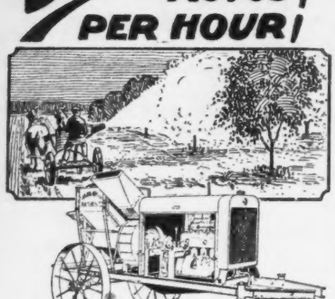

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Standardizing Spray Materials

This Interesting Article, taken from one of the Western Fruit Association Organs, Contains some Important Observations on Practical Spraying. The References to Reduced Spray Dosages should not be Confused with Scientific High Dilutions.

THE IMPROVEMENT in commercially manufactured insecticides and fungicides during recent years has been more noticeable than previously; better quality or standards as emphasized in the chemical and physical or mechanical properties of such materials standing out as accomplishments of note.

Along with such advances in the manufacture of spray materials has come a better knowledge of the application of these materials as related to pest control and a generally better quality of fruits, whether tree, bush or vine, has resulted.

Standardization is important, not only as it applies to the making of insecticides and fungicides and to the packing of fruits, but also to the application of materials which will enable the grower to gather crops free from blemish of either insect or plant disease. And, as it applies to the application of spray materials, probably the most important thing to consider is the use of dosages sufficiently concentrated to not only reduce or eradicate plant pests already present but to prevent the development of such pests that tree and crop may not be reduced in productiveness and value. It is generally conceded to be more economical to spray correctly to prevent infection or infestation than it is to eradicate or attempt control after a plant disease or insect has reached serious proportions.

Be Not Too Economical

Fruit growers are inclined somewhat to lower the concentration of spray materials when trees appear free from disease; a practice that frequently within a comparatively short time leads to difficulties that require expensive treatment to bring about the healthy condition everyone wishes in an orchard.

Many reduce spray dosages to effect a saving in orchard costs, when no doubt reducing other items in the growing of fruits could be done without so seriously affecting the final results of the season's labor. Spray material in nearly all sections is the lowest item of expense in growing fruits and yet one of the if not the most important item in producing better crops with higher market value.

Frequently one hears the statement that a grower's trees are clean or free from scale and other insects and that by spraying mostly for plant diseases, the concentration of materials can be safely reduced and some expense eliminated. It is well to stop and consider before reducing spray dosages the possible and probable condition of trees had less concentrated materials previously been used over a period of years. The value of many insecticides and fungicides often is not apparent within short periods but is best recognized over a long term of years when the accumulative effect has reduced both insects and diseases to a negligible factor. Opening the door to increased pest activity is very frequently the result of trying to "get by" with too weak concentrations of spray solutions.

Use Standard Concentrations

Manufacturers of insecticides and fungicides have invested hundreds of thousands of dollars in plants and equipment to turn raw materials into tested, standardized spraying compounds, which are recommended to the grower at concentrations designed to give the greatest efficiency and the least possible hazard in actual field work. These recommendations are based upon a knowledge of the materials and upon scientific facts regarding the control of plant pests. Deviation from such recommendations of any material may lead to injury of the plant or lack of control of the pests for which it is used and consequent monetary loss, the responsibility for which must rest with those who use or advise others to use at dosages contrary to those recognized by the manufacturer.

It is generally recognized that very definite concentrations of lime-sulphur solution are necessary for the control of scale and other insects. For the control of fungous diseases, exact dilutions are not so clearly worked out, although there are customary dilutions that from field experience seem advisable to use. Concentrations of dry lime-sulphur necessary to control insects and plant diseases have become established as the result of many thousands of field applications, and growers should follow the recommendations of the manufacturer. With this material, as perhaps no other, the chemical analyses of dry lime-sulphur and lime-sulphur solution have less bearing upon final results than does the chemical comparison of materials such as Bordeaux, arsenicals and oil sprays. The concentrations or sulphur in one cannot be used as criteria in determining the value of the other. This method of comparison is unjustified according to horticultural authorities who have worked with and noted results from the two forms of lime-sulphur. The manufacturer's recommendation covering the use of any spray material must be and is based upon a knowledge of that particular material and not upon those that may approximate or are nearly the same thing.

Home-made Sprays

Whether it be lime-sulphur, Bordeaux, arsenicals or oil sprays, it is recognized by nearly all authorities that commercially prepared materials surpass those termed "home-made." This is clearly indicated upon such points as solubility, suspension, spreading and adhesion, toxicity and duration of toxicity and the effect upon host plants. Chemically, though often not, the home-made material may be correct, but the other factors of physical or mechanical importance may be lacking and frequently result in decreased efficiency and increased hazards that offset the original first cost of standardized insecticides.

Recently a gathering of fruit growers was advised to use "home-made" Bordeaux on trees where there was "real" disease and the statement was made that growers might ease their conscience by using prepared Bordeaux or other materials, when as a matter of fact disease would not have manifested itself had no spray material of any kind been used. It is a matter of record that most of the prepared Bordeauxs are superior in every way to the "home-made" and that a grower using such materials is giving his trees the greatest possible protection from infection by fungous diseases. Certainly when growers have been using such materials for many years and when during epidemics of certain plant diseases their trees have come through the season unaffected by such diseases, the argument against prepared materials is unsound and unjustified.

Why Spraying Is Done

In the application of any fungicide, Bordeaux, lime-sulphur or any other material, the aim is to prevent infection of clean tissues from unseen, microscopic plant parasites. Commercially prepared fungicides do this over the longest possible period of time and are not so affected by elements that quickly reduce the value of home-made materials.

Spray materials should be purchased on the basis of SAFETY—first Efficiency and lastly Cost. — *Sunsweet Standard.*

How Pollination Increases Fruit Production

[*Continued from page* 4]

nating with some of the above self-fertile varieties.

Gooseberries and Currants

Very little pollination work has been done with gooseberries and currants, but such information as we have indicates that these fruits are completely self-fertile. The amount of fruit produced by isolated planting of one variety has been found to be as great as that produced by mixed plantings, and the quality of the crops has been as good. It is important, however, that insects be present to perform the work of pollination.

Brambles

All or nearly all blackberry varieties are self-fertile, but many, if not the majority, of the blackberry-dewberry hybrids are self-sterile. The true blackberries include such varieties as Early Harvest, Snyder, Eldorado, Ward, Blowers and Mersereau, all of which are self-fruitful. McDonald, Sorsby, Spalding and Rathburn are hybrids and are self-sterile, while Wilson is a hybrid that has been found to be completely self-fertile. Of dewberries, the Lucretia, in all probability the most extensively planted variety, is self-fertile and produces an abundance of pollen, but most varieties are partially or completely self-sterile and these should be planted with the Lucretia or with some other strongly self-fertile variety of blackberry.

Cumberland, Gregg, Improved Gregg, Conrath, Kansas and Black Pearl, black raspberry varieties tested by the Missouri Agricultural Experiment Station, have all been found to be self-fertile and self-fruitful. Cuthbert, the only variety of red raspberry used in the bagging experiments, was self-fruitful, but Cardinal, a black raspberry red raspberry hybrid, was self-unfruitful, which is probably true of many other such hybrids.

Strawberries

Strawberry varieties are of two types—pistillate, which bear flowers with pistils only, and staminate, which bear both stamens and pistils. Pistillate varieties, since they produce no pollen, are self-unfruitful. Staminate varieties are self-fruitful, except for a few like the Gandy, which produce only a small number of stamens with not enough pollen to develop all the flowers. One staminate variety is apparently as good a pollinizer for pistillate varieties as another, there being no evidence of inter-sterility in strawberries. Pistillate varieties are usually indicated in nursery catalogs by "P," pistillate, or "Imp," imperfect; staminate varieties by "S," staminate, or "Per," perfect. Sometimes "P" is used to indicate perfect varieties, but when so used, imperfect varieties are designated by "i" or "Imp."

P. A. hits me right where I live

COME to think of it, I've been smoking Prince Albert for so many years, I couldn't say just *when* I started. P. A. is as much a part of my day as a good breakfast. I'd as lief go without one as the other. Open a tidy red tin and you'll know how I get that way.

Fragrant, I hope to tell you. Then you chute a load into your old pipe and apply the match. Cool as a landlord demanding the rent. Sweet as the proof that you've already paid. Mellow and mild and long-burning . . . it seems like you never *could* get enough of such tobacco.

No wonder this friendly brand outsells every other on the market. No wonder one pipe-smoker tells another about the National Joy Smoke. If you don't know Prince Albert by personal pipe-experience, it's high time you got together. Millions of contented pipe-smokers will say the same thing.

More value all around —TWO full ounces in every tin.

PRINCE ALBERT

—the national joy smoke!

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IN fairness to yourself *drive the* NASH before you buy Your New Car..

Standard Six 4-Door Sedan

Now $925 *f. o. b. factory*

Call up your NASH *dealer, he'll send one out*

You'll often hear it said: "Nash gives more for the money."

And it is true! Particularly is it true, today, at the newly reduced Nash prices. Call up your Nash dealer and tell him to send out a car for you to try.

Drive it and show yourself the many advantages of Nash 7-bearing performance. No one else, at so low a price, offers you a 7-bearing motor. Nash gives you 7 bearings instead of trying to persuade you that 3 or 4 are just as good.

Notice the roominess inside the Nash. Instead of *scant* 5-passenger capacity, every Nash 5-passenger sedan is *full* 5-passenger capacity.

Feel the riding comfort that comes from the big, deep Nash cushions and the Nash alloy-steel springs, teamed with shock absorbers, front and rear.

And try Nash 4-wheel brakes—they stop you *immediately* and *smoothly* because of their *2-way* action (internal expanding, front; external contracting, rear).

Then notice the style and luxury that surround you. Nash cars were the style center of every Motor Show of 1928.

These are only a few of the many reasons why everyone today is saying: "Nash gives more for less." Know all of these Nash reasons before you buy your new car. *Call up your Nash dealer!*

Reduced Prices Effective February 1st

STANDARD SIX $845 TO $995——SPECIAL SIX $1135 TO $1445——ADVANCED SIX $1340 TO $1990

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(7661)

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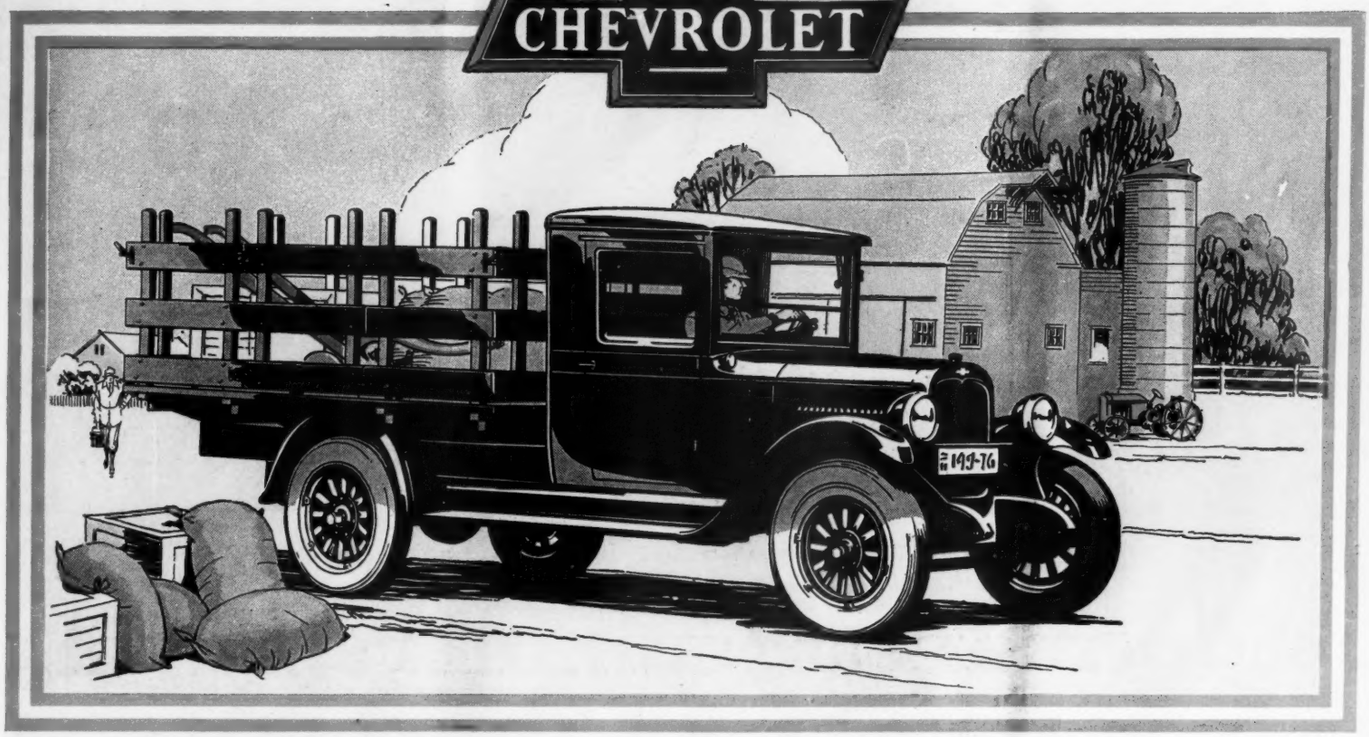

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for every Farm Requirement

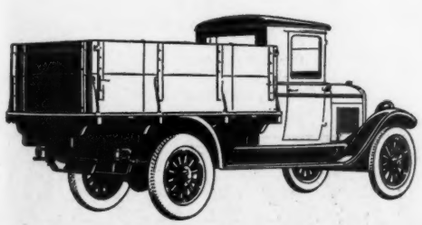
If the Chevrolet Truck had been designed and built expressly for use on the farm and for fruit and produce growers, it could not provide more abundantly those qualities of sturdiness, endurance and economy that are so necessary in a farm haulage unit.

From the big, oversize banjo-type rear axle to the powerful valve-in-head motor and heavy channel steel frame—every unit of this remarkable truck is built to stand up—to give years of dependable performance under every condition of usage.

This day-after-day dependability, combined with its low first cost and small consumption of gasoline and oil, has made the Chevrolet Utility Truck a haulage unit of amazing economy—as tens of thousands of users have proved by actual comparison.

Your Chevrolet dealer can provide a body type exactly suited to your requirements. See him today—and arrange for a trial-load demonstration.

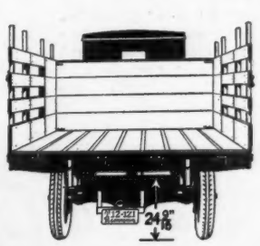
CHEVROLET MOTOR COMPANY, DETROIT, MICH., *Division of General Motors Corporation*



With a tongue-and-groove body that is absolutely grain tight, and equipped with a Comstock end-gate, hold-down rods and spreader chains—this grain body is adaptable to a wide variety of haulage uses.

Offering the most advanced modern design throughout, and built with a margin of over-strength in every unit, the Chevrolet Truck chassis is the sturdiest and strongest ever offered in the low-priced field.

The
UTILITY TRUCK
Chassis only
$495
f.o.b. Flint Mich.



Illustrating the width and the low platform height of the Utility Truck. This makes the truck unusually convenient for loading from the ground.

A summer spray for peaches

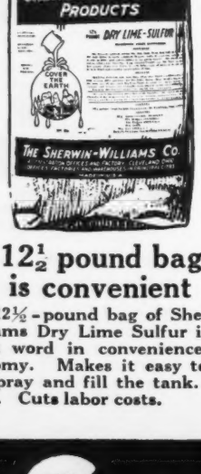
Mulsoid-Sulfur

A new S-W product, Mulsoid Sulfur, prevents brown rot and scab! Mixes easily and completely with water.

Extensive experiments have demonstrated its superior efficiency. Write for complete information.

For dormant and summer spraying use S-W Dry Lime Sulfur

at these recommended strengths



12½ pound bag is convenient

The 12½-pound bag of Sherwin-Williams Dry Lime Sulfur is the latest word in convenience and economy. Makes it easy to mix the spray and fill the tank. Less muss. Cuts labor costs.

Use Sherwin-Williams Dry Lime Sulfur at the strength recommended here.

For control of apple scab, pear scab and cherry leaf spot;
Use three to four pounds of S-W Dry Lime Sulfur to 50 gallons of water.

For the control of peach leaf curl, San Jose scale;
Use 12 to 15 pounds of S-W Dry Lime Sulfur to 50 gallons of water.

Spraying at these dependable strengths will control pests in your orchards. Moreover, your fruit will have a fine finish.

Use no more powder than our recommendations call for. They are backed by Sherwin-Williams Technical Department. Expert state horticulturalists have checked and approved these solutions. Results are so certain that practical growers follow these recommendations season after season.

Handling S-W Dry Lime Sulfur is more convenient than using the old liquid sulphur. The dry form does the job with a minimum amount of labor.

See your local dealer for further reasons why the dry form is superior. Secure a supply of S-W Dry Lime Sulfur from him.

THE SHERWIN-WILLIAMS CO.
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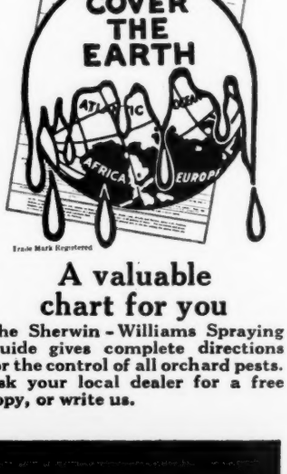

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A valuable chart for you

The Sherwin-Williams Spraying Guide gives complete directions for the control of all orchard pests. Ask your local dealer for a free copy, or write us.

SHERWIN-WILLIAMS
SPRAY MATERIALS

Artificial Manure from Straw

(*Continued from Page* 19)

The chemicals and water, combined with straw, form an ideal combination for the growth of bacteria. Straw in itself, or even straw and water together, will not rot in a short period of time; but the addition of the chemicals hastens the rotting process over the old method of letting the straw piles rot down naturally.

The mechanical problem of applying the chemicals to the straw evenly and in the right amount was solved by making an attachment to the threshing machine to apply the chemicals to the straw just as it went into the blower. A single section from a fertilizer drill was fitted with a hopper and extended shaft carring a pulley driven from one of the straw rack shafts. With a little study of size of pulleys and speed, the regulation of the size of the slot on the fertilizer attachment was simple enough to make this apparatus deliver the chemicals at the rate of 150 pounds per ton of straw. The rate of straw delivery was determined by the rate of grain threshed after weighing a few loads of sheaves and deducting the grain content.

The artificial manure resembles barnyard manure in all respects, according to Dr. Albrecht. It has the same general appearance and handles like it. One ton of straw will make about three tons of the artificial manure, which, in the experiments carried out on Mr. Poirot's farm, was ready to be applied to the soil by the first of December. Mr. Poirot used his artificial manure as a top dressing for wheat at the rate of six loads an acre, and the harvest showed an improvement in the yield and quality of the wheat and spelled the difference between success and failure in the clover seeded with it. The artificial manure has proved superior to a straw application in the case of alsike clover, and to barnyard manure on sweet clover, especially in cold and wet springs.

Careful records kept by Mr. Poirot indicate that artificial manure costs about 85 cents per ton. When the cost of hauling wheat straw to the barn lot and the manure back to the field is considered, that figure is reduced about 20 cents a ton. In addition, a greater amount of manure is gained by treating the straw in the stack, offsetting the losses from bleaching or scattering in the barn lot and other conditions which keep barnyard manure from getting to the field. Another important advantage gained is the clearing up of the old straw pile bottoms every year before the next planting season rolls around. In contrast, Mr. Poirot comments on an old stack bottom which contains the straw from 16 acres of wheat and has been using an acre of groun . six years in the process of rotting down. In regions where straw is habitually burned, this process will make it easier for the wheat grower to convert his straw into manure, thus returning fertility to the soil, rather than constantly taking it out.

Following the threshing season of 1927 Mr. Poirot said: "The results this year in our artificial manure experiments are more striking than ever. One ton of straw, or the straw from one acre of wheat threshed July 26, top-dressed an acre of wheat at the rate of four tons per acre on November 26. Eleven tons of straw gave 70 three-horse spreader loads of well rotted manure, weighing 46 tons. Yield tests on both clover, wheat and probably corn will be taken next summer."

Dr. Albrecht says: "Artificial manure will come in not only to eliminate, or rather to prevent, old stack bottoms, but to put into the soil the organic matter for humus so badly needed. It will return to the land promptly the fertilizer now quietly slipping away. Cornstalks and other farm waste may receive later attention, for with the threatening corn borer, we may need the heat generated by the chemicals in the rotting of cornstalks in such a process to help fight the European invader."

Shall We Plant More Grapes?

A RECENT REVIEW issued by the federal government based on a careful survey of the industry throughout the nation as a whole, indicates that the national outlook is for continued heavy grape production for several years to come. While the apparently slightly upward trend of the new high level of consumption may continue, it is likely to be too slow to remedy the situation without other aids. "In fact," concludes the Bureau of Agricultural Economics, "an immediate appreciable reduction in the acreage, particularly in California, would seem to be the best means of quickly relieving recent unsatisfactory marketing conditions."

The Department of Agriculture further points out that the situation in California continues to overshadow that of any other sections. Increased production in 1927 more than offset relatively light crops in the eastern and middle western states and resulted in a record-breaking production for the United States as a whole. Carlot shipments from California approximated the record movement of 1925, and the estimated tonnage dried for raisins was 42 per cent larger than last year and only slightly below the record production of 1923. In addition, over 10,000 carloads of mostly table varieties remained unharvested because of unsatisfactory market conditions. Growers contemplating the planting of new vineyards should not overlook the fact that future crops could be six per cent smaller than that of 1927 without changing the quantity entering the market channels, as approximately that percentage of the 1927 crop remained unharvested. Further, if growing conditions are as good in 1928 as they have been in five of the past 20 years, productions can easily be increased 10 per cent. There also is the likelihood of larger production in eastern and middle western states in 1928 than in 1927.

In eastern and mid-western states very few new plantings were reported during 1927. Crops generally were light due to unfavorable weather conditions. This was particularly true in the Ozark region where bearing acreage has increased more rapidly than in other sections in recent years. In the Ozark region the light crop of 1927, following a heavy one in 1926 which sold at low prices, has resulted in discouragement and it seems probable that returns received for the 1928 crop will have a large influence in determining whether the industry in that particular section is to continue to expand, or whether it will shrink rather rapidly.

The 1927 crop in eastern and mid-western areas was 17 per cent less than the average of the previous five years. It is likely, therefore, that the production in these areas during the next few years will be greater than in 1927 and that strong competition from California will continue. These conditions, with their probable effect upon prices, must be carefully weighed by any grower who contemplates the planting of new vineyards.

The above conclusions, reviewing some of the more outstanding highlights of the national situation, have been prepared by the staff of the Bureau of Agricultural Economics of the United States Department of Agriculture and represent the mature consideration of this organization with reference to the grape industry. They should be analyzed with care by every grape grower now engaged in the production of this commodity or by any producer planning further extensions. —*F. W. Read, California Fruit Exchange, in "The Blue Anchor."*

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Dr. Willson's Dust and Spray Mask gives you complete protection. Comfortable. Allows free breathing. Wear it when you're treating seed — threshing — or doing any other dusty, irritating work. Priced at $2.25. If your dealer can't supply you, write to us direct and we will send it C. O. D. Address Willson Goggles, Inc., 203 Washington St., Reading, Pa., U. S. A.

DR. WILLSON'S DUST AND SPRAY MASK

Fruit Farm Engineering

By E. W. LEHMANN

Reducing the Cost of Production

LABOR is still one of the biggest items of expense in producing farm products. The use of modern machines of production on the farm has contributed a great deal toward reducing the labor item. Man's time is multiplied many fold by the use of modern power machinery. It should not be overlooked that to obtain the greatest economy in the use of machinery, it should be used a maximum number of days each year, without reducing the timeliness of operation or impairing the efficiency of the machine.

It is poor economy to purchase an expensive sprayer for use on a family orchard that has a capacity for an orchard many times as large. It would be equally poor economy to purchase a tractor to be used for plowing only a few acres. One of the biggest items in tractor cost is the depreciation. To reduce this item of expense, it is necessary to spread the cost over as many operations as possible. This does not mean that the tractor should be used for those operations where a much smaller unit of power would be satisfactory. It is essential that some thought be given to a plan by which all machines will be used with greatest economy and efficiency.

Custom work means extra income. While doing custom work may not always be the best thing to do, yet a reasonable amount of custom work for the tractor or the sprayer often results in reduced costs as well as an extra revenue. It is rather evident that when a farmer has time to do plowing or other custom work for his neighbors, he is either neglecting his own farm or he does not have a sufficiently large farm to take all his time. However, many enterprising young farmers who are limited as far as land is concerned can afford to invest in a tractor and other equipment, because of the opportunity to do some custom work.

Care of Machines Reduces Costs

Increasing the life of machinery is another important factor in reducing the cost of depreciation and finally the cost of farm production. Every farmer might well ask himself the question, "How long should my implements last?" The question might be asked, "Are my implements lasting as long and giving as good service as Mr. Brown's, who is considered the best farmer in the county?" If the latter question cannot be answered in the affirmative, it probably is because Mr. Brown's implements are protected when not in use. Mr. Brown is also very careful to inspect his machines' needs before they are taken into the field, and he replaces worn parts before they break and checks up on all adjustments.

While the life of most farm machines might be measured in terms of acres covered, the character of the soil, its topography, and the crops involved are factors to be considered. The life of a plow will certainly be longer when used in plowing good prairie land than when used in plowing land that is rough, stony or stumpy. The kind of care a machine gets is no doubt the most important factor affecting its life.

Adjusting Plows

GOOD PLOWING has been emphasized as a means of corn borer control throughout the infested area. While good plowing is not a lost art by any means, yet many farmers are careless and fail to do a first class job. Good plowing is a sign of good farming; it is the first step toward a good seed bed, which is so essential to the production of crops. I. P. Blauser, of the Illinois Experiment Station, spent five weeks in Ohio a year ago demonstrating proper plow adjustment for clean plowing.

He stated recently before an Illinois farmers' week audience:

"Plowing, to meet corn borer clean-up, must cover the cornstalk and trash so completely that nothing remains on the surface, and so deeply that nothing is brought to the surface during seed bed preparation, or cultivation before the moths emerge. To do that type of plowing, the plow must be adjusted properly and special covering attachments used. Fourteen-inch bottom plows have given very good results, although the best covering is obtained by 16 and 18-inch bottom plows.

"The use of a rolling coulter, a jointer, and covering wire should be used for the best results. The coulter should be set to cut from five-eighths to three-quarters of an inch to the land in order to leave a clean furrow bank. It should cut from one-half to three-fourths the depth of the furrow, or deep enough to cut through all the trash. For average conditions, the coulter should be set so the bearing of the coulter will be over the point of the share.

"The jointer should be set to cut from one and one-half to two inches deep, and it is essential that the point of the jointer be close to the coulter to prevent trash from getting in between the jointer and coulter.

"The use of covering wires in addition to the rolling coulter and jointer are a big help in covering stalks and trash. No. 9 wire from 10 to 15 feet long is used. One end is fastened to the yoke of the coulter and the free end is allowed to drag under the newly turned furrow slice. The weight of the furrow slice stretches the wire which holds the trash against the furrow slice and prevents the trash from being pitched onto the plowed ground. In many cases it is necessary to use a second and even a third wire. The second wire is usually fastened on the coulter shank just below the beam, and the third wire on the beam from two to two and one-half feet in front of the coulter shank. Sometimes, depending upon the construction of the plow, a wire fastened to the axle of the furrow wheel does a great deal of good.

"The hitch of the plow should be adjusted so that the plow runs smoothly and cuts an even depth and width all the time."

Owing to the fact that the corn borer is spreading over a larger area each year, every farmer should do his part so that this pest may be held in check. Better farming and cleaner plowing are measures that might well be followed by all.

Making Electricity Pay Its Way

"FOR WHAT PURPOSE can I use electric power so that it will net me a return on my investment?" is the question that the farmer thinks about when considering the installation of electric power service, according to F. C. Kingsley, field engineer on the Illinois experimental line.

There are many ways in which electricity can be utilized that will pay part of the expense of many of the home conveniences rendered by electric service. Grinding your own grain for the dairy cows costs about one-half as much as to haul it to town or to your neighbor's to do the same job, for your time is worth something. By means of an automatic feeding arrangement, the grinding can be done without much attention. Some records kept on the Illinois experimental test line show that grinding and mixing chicken feed cost 50 per cent less than buying it in town.

It cost between $1 and $1.25 to elevate 3000 bushels of ear corn into one farmer's 24-foot crib. This farmer had a gas engine but used electric power, for it was cheaper and gave no trouble in the cold weather. A portable five horsepower motor can be used to grind feed, elevate corn, saw wood, mix concrete, pump water for the stock and many other jobs at a very low cost.

Lighting the poultry house to increase egg production is taken advantage of by many farmers who have electricity. Experiment stations have proved that this is a very effective way to increase egg production during the season of high prices. Incubation of eggs and brooding of chicks are other applications of electricity in poultry production that are becoming very popular, as it requires less care to operate the equipment, the temperature is controlled very accurately and fire hazard is practically eliminated.

Lubricating Oils

THE FACT that the kind of lubricant plays such a large factor in the life of a machine, every farmer and every other machinery owner, especially power machinery, should be careful in the purchase of this material. There are a lot of lubricating oils on the market. Some of these oils are of good quality, some are of poor quality, and some are practically worthless. The average person cannot accurately judge the quality of oil by its appearance. The only safe basis of selection would be either on the basis of an analysis made to determine quality, or on the basis of the reputation of the person or company from whom the oil is purchased. If oils are purchased in sealed containers with the brand of a reputable firm on it, one would have little to worry about.

Some farmers believe they can select an oil on the basis of how it feels. This is a poor basis for determining quality. I once saw a group of eight farmers who were attending a tractor school select their choice of oil for their tractor out of a lot of samples with a result that was embarrassing to them. Unknown to them, one sample bottle was filled with sorghum molasses instead of oil and out of the eight, three men selected the sorghum as first choice. This, I believe, is sufficient evidence that to select on the basis of how the oil feels might be a poor practice.

Many tractor manufacturers and automobile manufacturers make a definite recommendation as to the oil best suited for their motor. The operator, unless he is sure of the oil he buys, would do well to follow the manufacturer's recommendation.

When oil is bought through a co-operative farm oil company, the quality of the oil can be assured because such an organization can test the oil that is sold and see that it comes up to the standard requirement.

The "fly by night" oil salesman who sells an oil at a low price may sell an oil that will prove to be the most expensive in the long run. In the purchase of oil, don't forget the old saying that "oil is cheaper than machinery, and a poor oil is expensive at any price."

Choosing Electrical Utensils

IN CHOOSING electrical utensils, the first consideration should be the usefulness of the piece of equipment, according to Myra Jane Robinson of the home economics department of Cornell University. As an example, a waffle iron might be used only a dozen times a season, while a toaster would be used considerably more. It is evident that the toaster should be purchased before securing the waffle iron.

The electric iron is one of the first devices purchased when electricity is made available. It is a time saver, and it makes the work of ironing more convenient and pleasant. It is a device that is used many times a year, and its cost is low enough so it can

be afforded by everyone who has electricity.

Other electrically operated devices should be selected on the same basis. Think of the electric washing machine. It is considered more important than any other electric device by many farm women. It can be readily understood why this is the case when we give a little thought to what the job of washing entails. In the first place, it is a weekly job, one that must be done 52 times a year, and sometimes more than this when there are a number of children in the home. It is also a disagreeable job, one that makes Monday a "blue" day.

An electric washer makes washing easy, it cuts two hours or more off the time required to do the job, and changes Monday from "blue" to "pink." Any electric device that is used once or more a week and saves time and makes a hard task easy should be put on the list of things to buy as soon as possible.

There are several other factors that should be considered before selecting a piece of equipment, in addition to the amount it will be used. Will the particular device make the job easier or more convenient? Will the finished product be of better quality? Will it make the work more pleasant and agreeable?

Cost must not be overlooked. Can the particular piece of equipment be afforded? Will it be of as much value as something else? In considering cost, don't forget that there are other costs in addition to original price. The interest cost on money spent for equipment used in the home is not usually considered because such an expenditure is not ordinarily considered an investment. The operating cost should not be overlooked. In addition to repairs, there is the energy consumed. Of course, there will be depreciation, and finally the cost of replacement must be considered. In other words, the question should be asked, "How long will the particular piece of equipment last?"

Will Our Paved Roads Be Lighted?

WITH the greater speed of automobiles on our highways, there is an increased hazard for the farmer who drives on the road with a team after dark. One means of avoiding accidents is to have the roads well lighted. The number of miles of concrete pavement is being increased each year. In Illinois alone there is more than 6000 miles of pavement, with a program projected to build about 1500 miles during 1928. In practically every state, a program of road improvement is now under way. Will these highways be lighted or not as electric power lines are extended alongside them? is a question that should be of interest to every farmer.

There are, no doubt, many who would say that the idea of lighting our highways is impractical. The cost would be high if the lines were built for road lighting alone, but with lines being extended throughout the state to serve the small towns, community centers, and the farms, the prospects for lighting the roads appear more encouraging. No doubt many people who say the idea is impractical and not economically sound would have said the same thing about our present road program 15 years ago if someone had suggested it. They would have said, too, that it would be impossible for the people of America to own more than 20,000,000 automobiles. In fact, they may not own them, but they at least have the use of them; which is the important thing. According to one economist, any project is economically sound if it is wanted badly enough and can be paid for.

A statement made by Owen D. Young, chairman of the board of directors of the General Electric Company, is of interest in this connection. He declared that while the idea of electrification of highways and farms was visionary, it was practical and would without doubt be the next big step in the application of electricity, one of man's greatest servants, to greater use for the benefit of mankind.

The first problem to consider, according to Mr. Young, is the matter of lighting the public highways. "Think of the great benefit that would result if our state highways were well lighted at all times. It would mean a great decrease in the number of accidents. It would make the highways safe for travel by anyone at any time. The power companies are considering this matter very seriously at present.

"In order to light our state highways, it would be necessary to get the co-operation of the state highway department. A tax, very small and insignificant, placed on every motor vehicle by the state, would furnish enough funds to take care of the cost of installing these lights.

"Once the lines for the lights were extended by the power companies, the rest would be a simple matter. Of course, the farmers along the road would be expected to pay a part and subscribe for the power and lighting for their farms. If the farmers, the power companies, and the state department of highways will co-operate, the problem is solved.

"With the installation of the power lines, the farms would soon be electrified. It would bring every advantage of the city to the farmer and would tend to keep a more intelligent class of people on the farms. We are now discussing the matter of co-operation between the manufacturers of electrical equipment and the manufacturers of farm machinery so that the manufacture of standardized farm machinery, suited to the use of standardized electrical motors and other equipment, will be brought about. We are designing electric motors and electrical appliances of all kinds with the proper speeds so that they can be used on the farms with standard farm machinery."

This statement by a man who has lived on a farm and is now head of the largest electric manufacturing company in the country should be a word of encouragement for those who look forward to a time when a large per cent of our farms will be electrified. We already have some encouragement in the fact that the number of farms connected for electric service is rapidly increasing. No doubt the idea of road lighting will receive greater attention as more lines are extended to farms.

Good judgment must always be used in the selection of machinery. If a man has only a few acres of corn, he would be unwise to buy a two-row cultivator. However, if he has a large acreage and labor is scarce, it might be wise to discard the one-row machine for the two-row type. The thought should be kept in mind that it is useless to spend good money for machinery to save time unless time is really a factor.

Mrs. Capable: "If you're going to organize a club you must first frame a constitution and by-laws."

Mrs. Nitwit: "Well, we have a nice frame for the constitution, but where can we buy laws?"—*New Age.*

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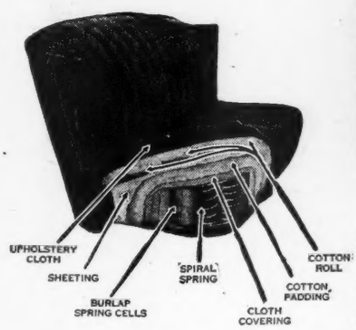

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Fruit Farm Poultry

By RALSTON R. HANNAS

Brooding the Chicks

HEAT and feed are two necessary requirements in the brooding of chicks, and all other requirements hinge on these. Brooding by means of a brooder, whether oil or coal stove, in a comfortable house is the method that is to be recommended today rather than the old method of allowing the hen to raise the chicks. The present-day method, if carried out properly, with good equipment, will permit of better sanitation, will keep the chicks under the control of the operator, and will permit the raising of chicks in larger numbers, hence more economically.

Heating the Brooder

The brooder stove must have been set up and running for a few days before the chicks are placed under it. A temperature of from 98 to 100 degrees just under the edge of the hover and about two inches off the floor is the desired amount of heat for the first week. After this time, the temperature is reduced about a degree each day until 80 or 85 degrees are reached—depending upon the weather—after which it is reduced more slowly.

A wise plan to prevent the chicks from wandering away from the source of heat during the early days and to break up floor drafts that are always likely to invade the brooder house is to make a circle around the stove and about a foot outside the edge of the hover. This circle can be made of ordinary inch mesh poultry wire and covered with bags or burlap, or it can be made of tar roofing paper, or wallboard or some similar material. Keep it up for the first two or three days, day and night, then every night for the first two weeks. It will probably not be needed after this time.

Have drinking pans or fountains ready for the chicks as soon as they are placed under the brooder; also have fine chick grit in small hoppers. If possible, give the chicks milk to drink and keep them on this for the first four weeks—longer, if possible. Four drinking fountains or pans to each lot of 250 or 300 chicks will be enough. Keep these near the stove so the chicks will not want to wander away from the heat to get a drink.

Give them nothing to eat for the first 48 hours after they have hatched, for if food is given them sooner than this, their small digestive systems are apt to be thrown out of order, since nature has provided for these first few days by having the yolk of the egg drawn into the chick's body just before hatching.

Feeding the Chicks

If it is desired to use the all-mash system of feeding, which is growing in popularity, the mash may be put before the chicks in hoppers. There are commercial mashes on the market designed for this method of feeding that are very good. If desired, an all-mash ration may be made similar to the following, which is recommended by the Ohio Agricultural Experiment Station: Ground yellow corn 65 pounds, winter wheat middlings or ground wheat 20 pounds, meat scraps 10 pounds, bone meal (raw) four pounds, and salt 1 pound.

Care must be taken to have plenty of hopper feeding space for the chicks so each chick may get his share. Allow no more than 50 chicks to a hopper.

If the grain and mash method is used, grain feeding may start after the 48 hours are up, giving them what they will clean up in about 15 minutes. Put the grain on a piece of paper or wood so they will see where it is. After a few days or a week of this method of feeding, the scratch may be fed in the litter. Feed the scratch grain five times a day for the first week, four times a day for the second week, and three times a day thereafter, until the chicks are eight or nine weeks old, when they may be fed twice daily.

Beginning with the second week, a dry mash should be placed in hoppers before the chicks in addition to the grain feeding that is given them. A good scratch ration is one composed of equal parts of fine cracked corn, cracked wheat and steel cut or pinhead oats. It is preferable to use a commercial mash as put out by any of the reliable feed manufacturers.

If it is desired to mix a home ration, the following may be used with good results: three parts bran, one part each of middlings, corn meal, ground oats and meat scrap with two per cent of cod liver oil mixed in. Feed green feed when the chicks are a week or 10 days old and from then on.

Some Habits of Chicks

Chicks will contract vices if they are not watched, chief among which are crowding, tail and toe picking, and over-eating. Crowding is generally due at first to their being either too hot or too cold—they either crowd away from the source of heat or towards it. If the correct temperature is not maintained, this sort of thing progresses, and frequently it continues after the temperature has been corrected; it becomes a habit.

One of the best ways of correcting this, besides having the proper temperature, is to have them roost early—at least at the fifth or sixth week. This may be done by having hinged roosts on three sides of the brooder house that may be raised during the day and lowered at night. These roosts may be hinged to the wall of the house about 10 inches or a foot from the floor and slope down to the floor, with three rows of roosts on them. If crowding becomes a habit before this time, it may be necessary each night to go into the brooder house after dark and divide the chicks up evenly around the brooder stove, which is a laborious job.

Another habit that is frequently contracted is that of toe picking or feather picking around the tail. The best thing to do in such cases is to darken the house during the day, except during feeding times, for two or three weeks until the habit disappears. Those that are picked may be treated with tar or bitter aloes and allowed to run in the pen again.

If there is a tendency towards overeating, as there sometimes is, simply remove the mash hoppers or drinking vessels or whatever it is they are eat-

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ing too much of, and allow only the hoppers or fountains to remain in the pen for a half hour or so at a time. Do this for a few days, after which the time may be gradually lengthened until they are again allowed to remain in the pen all the time.

Are the Trapnests Working?

ON FARMS where trapnesting is being done, it is important to see that the nests are working properly. A hen's record is only as good as the accuracy of the trapnest and the man doing the trapping.

The heavy flow of eggs is on and it should be the desire of every poultry keeper to have a record of every egg laid in the trapnest pens. This can be done only if each nest is functioning as it should. Examine now to see if the trigger in each nest works as it should. It frequently happens that this becomes stuck for one reason or another and simply needs to have the screw by which it is fastened to the side of the nest loosened. It may be that it needs tightening. It is the most important part of the nest and must be in tip-top working order. Too much nesting material will sometimes clog the trigger so it will not work.

See that there are no sharp corners on the nests that the birds might catch their combs on and tear them. Perhaps some of the birds are smaller than the others and are able to scoot out under the doors of some of the nests before the attendant can arrive to trap them. A short piece of wood can be nailed on the bottom of the doors of these nests to prevent this. The doors may sag a little, which will need adjusting. This adjusting can best be done perhaps, depending on the construction of the nest, by bending the heavy wire that holds these doors in place.

If trapnesting is being done, it might as well be done right, so that each bird will receive credit for each egg it lays. To that end it is necessary to see that the nests are kept in excellent working order.

Turning Off the Lights

MOST poultry keepers stop using lights in their laying houses for the purpose of increasing egg production by the first of April. Many stop about the fifteenth of April, while others stop about the middle of March. By the first or middle of April, the birds are getting about 12 hours of natural daylight, so there is no purpose in using lights after this time.

Lights should be turned off gradually. Turning them off suddenly throws the birds into a molt and results in an unnecessary sudden drop in egg production. Some birds are likely to molt anyway when the lights are turned off, though not many if the change is made gradually.

A cut of from 10 to 15 minutes per day is made until the lights are finally off. If early morning lights are used, they are turned on 10 minutes later each day, and if evening lights are used, they are turned off 10 minutes earlier each night. The same is true when the evening lunch method is used. A gradual cut is made in the grain that is fed while the lights are being taken off gradually. When the lights are finally off, no extra grain need be fed as was done while the lights were being used.

Clean Pens

CLEAN PENS for all birds are extremely important. One way to keep the pens clean is to have clean litter in them. If this litter is wet by a rainstorm, change it so the whole house will not become damp and foul smelling. Such conditions are ideal for the spread of disease—roup and canker especially—particularly if cold weather sets in. Straw makes as good a litter as anything, although many poultrymen have found the use of peat moss satisfactory and are using it for their layers as well as for their chicks.

It will pay to remove the litter at least once a month during the winter unless rain or snow has dampened it, when, of course, it should be removed at once. It will quite often be necessary to spread the litter around if the hens scratch it all to the rear of the house. If there are small windows in the rear under the dropping boards this will not be so necessary, as the birds will then not scratch it to the rear as much as when windows are not present. Cleanliness must be maintained at all times.

Poultry House Design

THE EARLY TYPE of poultry houses were made tight without windows for either light or ventilation. Only a small door was provided through which the fowls passed, and a larger door allowed the owner to enter as occasion demanded. Such houses were dark, damp and unsanitary. The next step in poultry house design was the open front house, which was the other extreme. Such a house becomes very cold and disagreeable. While the poultry specialists are not all now entirely agreed as to the best type of house for maximum egg production, many of them seem to be of the opinion that a well-built house that may be maintained at a temperature slightly above freezing is desirable.

The Missouri type house with straw loft has the desirable feature of being warm in winter and cool in summer. The use of special insulating material for lining poultry houses to keep old biddy warm is being suggested in some quarters. It is quite evident that to keep up egg production the hens *must* not be exposed to extreme cold weather conditions. This can only be avoided in very cold climates by better buildings supplemented with heat.

If you expect to build a poultry house or brooder house during this year, get the best plans that your experiment station has to offer. The station is in a position to help you.

Corn Shucks for Litter

I RECENTLY ran across a Texas poultryman who is using corn shucks for litter in his laying houses. It makes a mighty fine litter, as it does not break up so fine as straw does. It makes a mighty clean litter and is ideal for feeding scratch grain in, as the grain sifts through to the floor, thereby making the birds scratch for it.

He changes this litter every four weeks, although at the end of this time it is in better condition than straw is after it has been used as litter half as long as this. It is cheap; he pays 25 cents a bale for it in carload lots.

If you want to paint but haven't the time or the help, spray painting is worth your consideration. Remember that farmers in this country are losing more than $830,000,000 a year because of painting neglect. Be enterprising and progressive enough to get together a group of your neighbors and see if you can't organize. The purchase of the equipment will pay for itself many times in the preservation of farm buildings and the increased value of your property.

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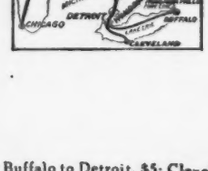

Fares: Buffalo to Detroit, $5; Cleveland to Detroit, $3; meals and berth extra. For the Chicago-Mackinac Island tours fares given are for the round trip, and include every expense on steamers: Buffalo to Mackinac Island, $49; to Chicago, $79. Cleveland to Mackinac Island, $41.50; to Chicago, $71.50. Detroit to Mackinac Island, $30; to Chicago, $60. Stopovers at Mackinac Island and other ports. For reservations, address E. H. McCracken, G. P. A., Detroit and Cleveland Navigation Co., Detroit, Mich.

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The Dietsch System of Pruning

A Unique but Thoroughly Practical Method of Overcoming the Upright Growth of Desirable Varieties, by Tying down the Branches and Forcing a Spreading Growth.

By B. Franklin Dietsch

ABOUT three years ago I started working out a practical method of tying down limbs on upright growing trees, such as the Northern Spy apple and some varieties of pears and plums. At that time I was convinced that our five-acre block of four-year-old Spy trees could never be made to grow into the type of trees I wanted by cutting alone. It took much study and experimenting, but I believe my efforts have been rewarded.

Figure 1 shows the base of a six-year-old Spy tree, six months after it was very lightly pruned and tied down. At the time the picture was taken, the tree was completing its seventh year of growth. Figure 2 shows the top of the same tree. Figure 3 is a close view of the tree in the background shown in the lower left-hand corner of Figure 2. From A to B is 12 feet, which gives an idea of the size of the trees. Above the location A to B in the top of the trees can be seen the limbs growing in their natural way. From the tie C in the direction of the arrow can be seen quite clearly the loop slip knot.

Method of Procedure

The method of procedure is as follows: First, place around the base of the trunk some pruning twigs about the size of your little finger or a very large lead pencil, keeping them an inch or two apart and shoving them into the ground when possible, so they will not fall while making the first tie. Then, guess the length of binder twine necessary for the tie as you pull it from the ball, and double it once or twice, depending on the size of the limb to be tied. Place the loop you now have around the center of the twigs and make a loop slip knot, pull the limb to be tied down a little below its desired position and tie the end of the twine to one of its laterals. If the limb is a strong one and you do not get the desired angle in the crotch by merely pulling it down, saw the limb from the lower side about half off at a place about the location of D (Figure 1). Tying will close the wound, enabling it to heal over the first year in most cases.

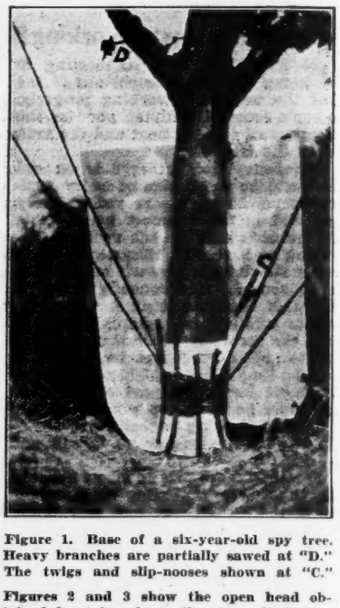
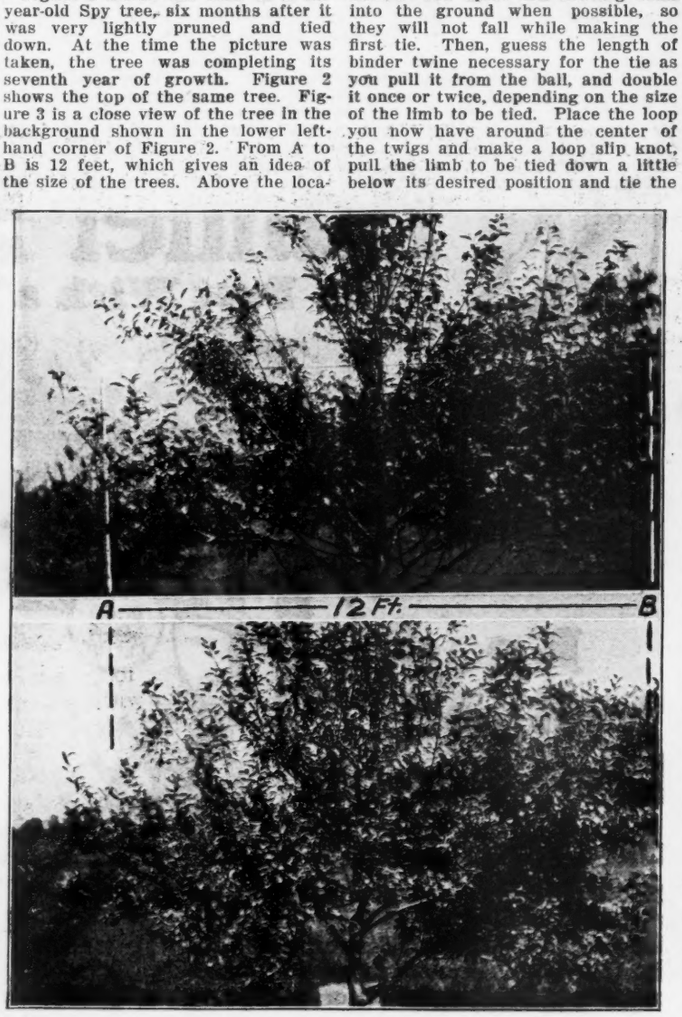


Figure 1. Base of a six-year-old spy tree. Heavy branches are partially sawed at "D." The twigs and slip-nooses shown at "C."



Figures 2 and 3 show the open head obtained by tying down the outer limbs.

The shrinking and drying of the pruning twigs helps relieve the pressure on the expanding trunk of the tree as it makes its growth, and at the same time the tied down limbs are gradually losing their pull on the twine, so there is practically no injury to the trunk underneath the ties.

The best time to do the work is in late winter or early spring, and the ties can be left on from one pruning till the next. After making a year's growth, the tied down limbs will retain their position as if trained by a heavy crop of fruit. Trees from four to eight years of age, depending on their size, are the most practical sized trees to work on.

The twine for making ties on such trees as shown in the pictures costs about four cents per tree, and it takes one man from 10 to 15 minutes to do the work.

Are well shaped, open type young trees worth working for? And where is there a fruit grower who loves his work who will say he enjoys slashing and cutting away at his young trees in order that they may shape themselves properly, when he knows that he is thereby delaying the bearing habit instead of helping his trees to come into early bearing?

Now Time to Graft Grapes in the North

LATE March or early April is the preferred time for bench grafting grapes for New York vineyards, according to information on grape grafting contained in a publication just made available at the experiment station at Geneva. Grafts made at this time may be held several weeks before setting in the vineyard, it is said, providing they are not exposed to high or low temperature or to extremes of moisture or dryness.

"In grafting the grape, there is a time and a way, not so particular as many believe, but rather more particular than in grafting most other fruits," says F. E. Gladwin, station grape specialist and author of the new circular on grape grafting. "Out of many, a few of the simplest methods of grafting grapes now in use are described, any one of which may be modified to meet local conditions.

"Greatly improved quality and increased yields of fruit are the chief advantages to be gained by grafting desirable varieties of grapes on hardy rootstocks. Such well-known varieties as Delaware, Campbell, Niagara, Concord, Iona, Catawba, etc., have certain defects which detract from their value as commercial possibilities. Some of them set more fruit than they can mature; some are erratic in their bearing habits and are over sensitive to soil conditions; while some have the 'off-year' habit to a marked extent or tend to 'run-out' or deteriorate in yield and quality. Although grafting is not a cure-all, many of these defects have been overcome by grafting these varieties on hardy rootstocks.

"The cost of grafting is still a serious handicap to the method coming into practical use until more economical processes can be perfected. Indications are, however, that cheaper methods will soon follow, and in the meantime, grape growers might well give the method a trial on a small scale. Certainly, in small vineyards for home use, grafting vines are to be preferred to those propagated by cuttings."

Markets & Marketing

Commercial Fruit Trade Notes

Discussing the development of agricultural co-operation in the United States, R. H. Elsworth, of the United States Department of Agriculture, compared the movement to a series of waves. "These," he said, "have not been of equal magnitude, nor have they been evenly spaced through the years. As each wave broke, it lost its momentum. Furthermore, the waves did not reach the crest in all parts of the country at the same time. Besides the big waves, there were minor local waves and cross waves produced by various commodity-group developments. Despite the backwash from the waves, there has been a material gain throughout the years in the number of individuals participating in co-operative enterprises, and in the volume of sales and purchases made on a co-operative basis."

In analyzing the development, Mr. Elsworth noted that of 10,803 co-operative associations listed by the Department of Agriculture in 1925 only 102 had been organized prior to 1890. Since 1905 there has been a notable increase in the number of associations formed each year. The years 1912 and 1919 recorded marked increases, and 1920 holds the record for the formation of co-operative organizations with nearly 1400 associations formed that year. Two-thirds of the associations active in 1925 were formed after the beginning of 1915.

The school of co-operative marketing held at Jackson, Tenn., early this year, was attended by over 400 agricultural leaders and farmers of the state. The school was conducted under the auspices of the College of Agriculture, University of Tennessee, in co-operation with the various marketing associations of the state and the Division of Co-operative Marketing of the state and United States Department of Agriculture.

The program was designed especially for directors and employees of co-operative associations, county agents and agricultural teachers, bankers, farmers, and others directly interested in the operations of co-operative marketing organizations. Various phases of marketing were discussed, emphasis being placed on problems in business management and membership relations. The meeting was attended by officials and directors of farm bureaus and other marketing associations, Smith Hughes teachers, county agents and farmers.

After suspending operations during the 1926 season, the California Grape Growers' Exchange, San Francisco, resumed its work in 1927, with a largely increased membership. The exchange began marketing grapes for its members in 1920 and continued six years.

In 1925 the exchange had only 600 members, by the first of 1927 the number had grown to 1000, and early in January, 1928, it had reached 1221, more than twice the number in 1925. One hundred twenty-five names have been added since the 1927 season closed, according to a statement by the management.

The management reports that the exchange rendered many services last year at a cost of about $1 per ton, including the following: It informed members regarding cultural methods, marketing and legislation; billed cars for members and furnished transportation bonds; assembled grapes in carlots for the convenience of members shipping small quantities; provided sales service with the necessary collection and distribution of revenues and the accounting and auditing; provided means of selling released crops for members who had opportunities to sell at better prices; obtained permits for sold cars; advertised grapes in trade journals in this country and in foreign publications; prepared a summary of market conditions and buying power in all the important markets of the United States; gathered crop reports from all parts of California; made efforts to reduce transportation charges; tested grapes of members for their sugar content; encouraged the policy of f. o. b. selling, that payments might be made to growers direct.

For the 1928 marketing season the exchange is considering the matter of employing paid representatives in the eastern markets to secure contracts in advance. The adoption of a trade-mark is also being considered.

"The Consolidated Apple Growers' Exchange, Cornelia, Ga., has had the most successful year in the history of the apple orchard industry in Georgia from the co-operative standpoint," according to J. Frank Beck, president of the exchange. "It was a short crop both in Georgia and in the country at large, resulting in a more orderly condition of marketing.

"It was the best crop in quality that we have ever grown," reports Mr. Beck, "enabling the exchange to get a favorable comparison with the fancy apples grown in other sections. The result gave us good prices, above normal, and created for our Georgia apples favorable trade recognition, such as we had never before enjoyed. In establishing this good reputation for quality, the trade is now freely taking Georgia's product.

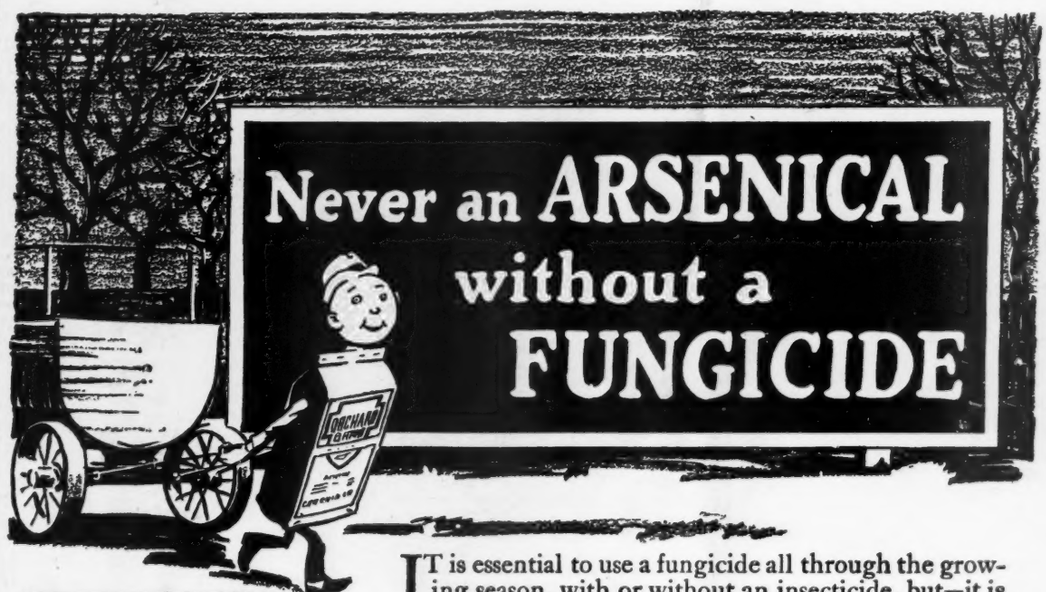
"Under the construction laws passed by our last legislature governing standardized grading and packing, with the label guaranteeing the contents, our exchange is realizing its ambition to market 100 per cent properly packed packages. Our boxed apples are now winning the confidence of the buying public.

"We still need the loyal support of our own people in giving preference to our mountain grown apples, 'The finest flavored apple grown.'

"The exchange is now engaged in a campaign to clean up or remove neglected and abandoned trees in Habersham county, that, because of disease infection, are now a menace to commercial orchards and the industry generally. This requires the co-operation of the enlightened public."

An increase in share capital from $300,000 to $1,000,000 has been authorized by the shareholders of the Yakima Fruit Growers' Association, Yakima, Wash. The new capital will be used for new buildings as needed. It is proposed from time to time to convert the accumulating surplus into share capital and to distribute the shares among the members. That portion of the share capital represented by preferred stock will carry a dividend rate of six per cent.

This organization was started in 1912 as a membership association, being changed in 1918 to a stock corporation with authorized capital of $150,000, which was increased later to $300,000. The association has developed more rapidly than was expected and is now handling a business that requires a considerable amount of capital.



IT is essential to use a fungicide all through the growing season, with or without an insecticide, but—it is never profitable to use an insecticide without a fungicide.

Start early, using "ASP" Dust, or "Dritomic" Sulphur with the double-dose "Orchard Brand" Arsenate of Lead calyx spray on apples, and the petal-fall arsenical spray on the stone fruits.

Remember! It's the calyx spray kill that prevents heavy second and third broods of codling moth. Double the dosage now and you'll not need heavy arsenical spraying on the growing fruit. "ASP" Dust, "Dritomic" Sulphur and "Orchard Brand" Arsenate of Lead are adding thousands of dollars to the harvest value of the crops in every fruit growing district. Clean and full-color fruit commands a premium. Use these materials and sell at the top of the market.

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"Asp"
"85-15"
"90-10"

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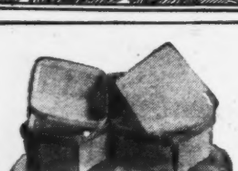
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The Editor's Mail Box

COMMENTS and QUESTIONS

The Use of Kudzu

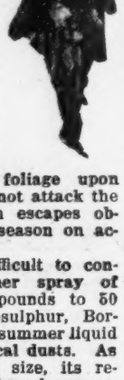
Editor, AMERICAN FRUIT GROWER MAGAZINE: Can Kudzu be grown on land that will later be planted to fruit? Can it be readily killed and the land cultivated to other crops? At present I am interested in pasture for live stock.—C. C. C., Oklahoma.

ANSWER: Kudzu would prove a valuable crop not only as a permanent pasture but as a means of supplying nitrogenous fertilizer to the soil. If it is your intention later to set fruit on this land, Kudzu is easily killed out by summer plowing.

Bag Worm

Editor, AMERICAN FRUIT GROWER MAGAZINE: What is the enclosed? I find them hanging to the end of apple twigs.—B. S., Kentucky.

ANSWER: The object which you sent us is the winter egg bag of the Bag Worm (*Thyridopterix Ephemeraeformis*). The insects winter in the egg stage in the bag protected by the larval and pupal cases of the female. These eggs hatch in May or June and the young larva comes out from the bag and starts spinning a new bag, which the young larva carries with it while feeding. The larvae reach the adult stage in August or early September. After mating, the female attaches the bag to a small branch or twig and lays her eggs therein, completing the life cycle.



The injury by this insect is confined to the damage done to the foliage upon which it feeds. It does not attack the fruit. The insect often escapes observation early in the season on account of its small size.

The insect is not difficult to control with early summer spray of arsenate of lead two pounds to 50 gallons of water, lime-sulphur, Bordeaux mixture, or other summer liquid sprays. Or with arsenical dusts. As the insect increases in size, its resistance to arsenical poison increases and in later sprays the arsenic content should be increased to two and one-half pounds to each 50 gallons of spray liquid. It is advisable while pruning the orchard in the winter or early spring to pick off and burn the bags. If this is thoroughly done, the pest will be eliminated from the orchard.

Pruning, Fertilizing and Color

EDITOR, AMERICAN FRUIT GROWER MAGAZINE: The enclosed photo shows a section of our Spy orchard. These trees until two years ago had never been pruned and had skirting limbs almost to the ground. These have been removed and the tops thinned until with the third and present pruning, they are fairly open.

This pruning rather upset their fairly heavy annual bearing, although last season they produced an average of 60 per cent of a full crop, with some trees producing 25 bushels and the color on the whole much better than it has ever been.

Previous to two years ago, the fertilizer used was barnyard manure. Since then we have used nitrate of soda and acid phosphate. The first year we used five pounds per tree, evenly broadcasted, the second year six pounds, and the question arises now, how much nitrate can we profitably use? In addition to the nitrate, we are using 10 to 12 pounds per tree of acid phosphate—theoretically to make a balanced ration, and if there is anything in another theory, to hasten maturity.

On this heavy soil, apples color slowly and Syps are the last to show red. We run into serious danger every fall waiting to get maximum color, yet color we must have and everything else, including quantity, must be sacrificed for red apples. The pruning the past three years undoubtedly has helped the color, but what about additional nitrogen? How much can we use in order to force our trees to maximum bearing without sacrificing color by delaying the ripening process or by shading from excessive leaf growth? Can we use eight, 10, 12 or more pounds per tree, or what is the limit?

I doubt if a permanent sod mulch would be advisable on this soil. It is cold and early spring cultivation seems necessary to warm it up quickly, with frequent harrowing to prevent it getting hard. We are gradually improving the mechanical condition of the soil by using chemicals which stimulate cover crop growth, making additional vegetable matter to plow under.

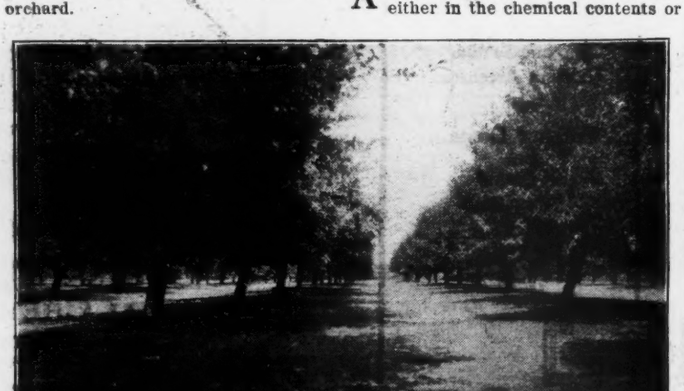
I would like to have these matters discussed by your correspondents.—*S. B. Hatheway, Orchards of Ontario Company, Ltd., Port Hope, Ontario.*

Liquid or Dry Lime-Sulphur

Editor, AMERICAN FRUIT GROWER MAGAZINE: Is liquid lime-sulphur superior in any way to dry lime-sulphur? Our dealer claims the only difference is that the liquid has the water in it while the dry has not, and there is no use to pay freight on water.—D. B. S., Iowa.

ANSWER: There is no difference either in the chemical contents or in the fungicidal value of concentrated liquid lime-sulphur and dry lime-sulphur except for the water in the former. In the manufacture of dry lime-sulphur, the lime and the sulphur go through exactly the same process as with the liquid concentrate except that a sugar is added to the

(*Continued on Page 40*)



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J. E. Frawley, Manager

Creation of the Pineapple Industry

(Continued from Page 6)

allows, the fields are laid out with roads 300 feet apart, thus making the pineapple rows of that length. The lines are marked out and mulching paper, usually a 36-inch asphalt saturated paper, is laid on the ground with the edges covered with soil. The plants are commonly set in a double row through this paper. For planting material, one uses the crowns from the tops of the fruits, the slips borne on the fruit stem, or the shoots arising lower down on the main stalk of the plant.

In a few weeks, if there is adequate moisture, the plants start to grow. One great handicap in the earlier years was the failure of pineapples grown on many of our soils which were rich in manganese. It was found that this was due to iron starvation induced by the manganese, in spite of the high percentage of iron in the soil. On the basis of tests made by Maxwell Johnson, formerly chemist at the federal experiment station, the spraying of the growing plants with a solution of iron sulphate has been adopted as standard practice on most lands.

Fall Planting Practiced

The planting is usually done in the early fall and the plants yield their first crop of fruit the second summer following a period of 18 or 20 months of growth. After fruiting, the plant throws out shoots from its main stalk, two of which are usually allowed to remain. Normally each should produce a fruit the following summer. Thus in the plant crop one expects one fruit on each plant and in the ratoon crop, two. If the plants are healthy, they should continue to throw out shoots yielding a third crop or even more. The ratoon fruit is smaller than the plant crop and furnishes the material for the smaller sizes of cans, although a part will run large enough for the bigger size.

This all sounds simple enough in this brief telling, but in practice it requires great skill and attention to details. A great deal of money goes into an acre of pineapples before ever a fruit is picked. Four hundred dollars an acre would not be an unusually high figure. If one is to make a profit from his fields, he must get second and third crops from a planting. I intimated a while back that nature did not always approve of man-made innovations. She often takes occasion to demonstrate that with pineapple growers. Crop failures due neither to laziness nor niggardliness are all too frequent. We have aplenty to learn yet about growing pineapples, which is one reason why the industry maintains an experiment station.

Continuous Cultivation Harmful

Pineapple agriculture has been going through an interesting evolution. It is only a few years ago when we thought that we must have virgin land to grow pines. There was a good deal of moving about onto new lands, and taking of lands on short time leases. With the stabilizing of the industry and the realization that we had but a limited area which was well suited for pineapples, there began the evolution of what may be called permanent pineapple agriculture. One thing is clear, that as far as we now know one cannot cultivate pineapples continuously on a given area as can be done with sugar cane. Some system of resting and rejuvenating the land must be pursued or very serious losses are almost certain to follow. The practices are by no means standardized as yet, but substantial progress is being made in the direction of systems of cultivation which will conserve our natural resources of soil fertility and at the same time give us profitable crops of fruit. We are coming gradually to think in terms of production per acre over a period of years, cropping seasons and resting seasons, rather than merely tons of fruit per crop. The question is becoming not "Where can I get new land?" but "How can I best develop and maintain my lands for permanent production?"

Fortunately, there has been practically no competition for lands between our two major industries. In general, pineapples seem to do better at rather higher elevations than cane and require much less water. Most of the lands now in pineapples were formerly ranch or even waste lands. Some areas formerly in sugar are now in pines, but that is exceptional. No pineapples are grown under irrigation. Like cane lands, pineapple lands must give a high gross return per acre. With most field crops on the mainland of the United States, the gross value of the product per acre is not very great. Twenty-five bushels of wheat or 75 bushels of corn, yields well above the average, give but a fraction of the money value per acre of a crop of either cane or pineapples. This is fortunate for us here in Hawaii, since our area of arable land is small.

One of the Chief Sources of Income in Hawaii

As things now stand in Hawaii, sugar and pineapples are the two chief sources of income, with pineapples contributing about one-half as much as sugar. In the case of sugar, there is no competition between the several companies operating here. Their product is but a very small fraction of the world's production and they have no control over the price. The pineapple companies, on the other hand, are competitive and their output is unique. It is true that some canned pineapple is produced outside Hawaii, but it is not as yet in the same quality class as the Hawaiian product. Hawaiian canned pineapple does, however, belong in the large group of canned fruits and the high grade temperate zone canned fruits, peaches, pears, apricots, cherries and the like, are in the same quality class and the same price range. We are not quite as free of the world's market and its price levels as might at first be supposed.

In invading the canned fruit field, we have, perhaps, not been regarded as an unmixed blessing by some of our neighbors on the Pacific Coast. If the output of canned peaches, for example, looked something like our production curve turned upside down, I'll admit that our coast friends might have some cause for tears. As a matter of fact, I note that the California pack of canned peaches jumped in the 10 years from 1916 to 1926 from 3,800,000 cases to 14,400,000 cases, while our pack of canned pineapples was growing from 2,600,000 to 8,940,000. In other words, while the pineapple industry was growing 244 per cent, the California canned peach industry grew 280 per cent. The worst that can be said for us is that we are like Mr. Phinney's turnip:

'Mr. Phinney had a turnip
And it grew behind the barn,
And it grew, and it grew,
And the turnip did no harm."

We like to believe, however, that pineapple production and canning has not only added a valuable industry to Hawaii, but that our product has made life just a little bit more pleasant for millions of our fellow countrymen, and perhaps that is about all that any of us can hope for.

Those interested in mental hygiene put the important question of self-direction rather strikingly when they point out that the best machine has not necessarily the best driver. Their ooject is to make us better chauffeurs of the individual machine that must serve each one of us for the conduct of our lives, so that, in this rapid, congested era of world development, we may learn to avoid painful collisions and rough bumps.

"Quick, Sam, a wildcat's jes run into tha' house with yer wife."

"Wal, he'll jes' have to git out the best way he can!"

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FISK TIRES are protected against cord breakage or internal friction by *"Fillerless"* Cord construction, an original Fisk process. Cords are laid straight and smooth, without "filler" or cross strands. Each cord is sheathed in pure, live rubber. All cords are held under equal tension.

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FISK TIRES

The Orchard Home

By MARY LEE ADAMS

April in the Orchard

"Oh! to be in England, now that April's here,
When he who lives in England, sees some morning unaware,
How the topmost boughs and the brushwood sheath
Round the elm tree boll are in tiny leaf,
And the throstle swings on the orchard bough
In England now."

THAT goes for America too. There's not a day between earliest and latest April that apple trees are not blooming somewhere in the United States

Every month has special champions. Children prefer December because of Christmas. Sweethearts love June because of weddings. Some look forward to November for Thanksgiving and turkey. The aged man greets April gladly because he has noticed for a long time that if he manages to live through March, he lasts the rest of the year.

March itself, the much abused blusterer, has at least one sturdy advocate who welcomes it beyond all other months because it ushers in April. That comes close to liking April best. For myself, I'm not ashamed to be an April Fool.

People who are lucky enough to live in apple orchards, just naturally love April. It is the month of promise. As with promising youth, expectations may be unfulfilled. But so long as we have faith to hope and dream over our boys and girls, so long will we rejoice in the beauty, fragrance and promise of April.

A Good Green Eye

HAVE you green eyes? Instead of keeping them cast down in hopes they may pass for grey or blue, you should look the world proudly in the face as who would say, "See my eyes. They're green, which indicates high moral development and intelligence beyond the ordinary."

That's what the red-heads have done. Weary of the slurs upon "carrot," "sorrel," or "brick top," they have banded together in a club whose name boldly proclaims the color of their hair. They demand recognition of the mental superiority of red-heads, and lately put forward red hair as a recommendation for public office. I warrant a "Green-eyed Club" would show as high an average of brains.

Nor need the saying that beauty and brains are seldom put in the same package d i s m a y the green-eyed woman.

That charming writer and naturalist, W. H. Hudson, has an entertaining chapter on eyes in which he asserts that "emerald eyes, if they only existed, would certainly be beautiful beyond all others." He laments that in a lifetime of looking he has not found them.

But the simple layman may be more practical than the scientist. Any grey-eyed maiden might have satisfied Hudson's quest by winding an emerald scarf around her throat, for clear grey eyes reflect other hues. Had she wished completely to bewilder the man of letters, she might later have exchanged this scarf for one of sapphire, and burst upon his astonished gaze as a blue-eyed beauty.

There's no ground for complaint from the possessor of green eyes. If one likes them, well and good; if not, change them. Black or dark brown eyes may be very lovely, but whether we like them or not, they remain black or brown. Grey or green eyes on the contrary (and in lesser degree light blue and hazel), are capable of change or modification.

If you like your green eyes, wear a touch of that color to accentuate the hue. If you fancy grey eyes for a change, try pink near the face, while if your mood or some particularly sentimental occasion calls for blue eyes, wear just the shade of turquoise or azure most becomingly reflected by the windows of your soul.

Better Homes for the Fruit Farm Family

THERE are estimated to be 25,000,000 families in the United States, and it is interesting that the movement for better homes has taken the form of a personal letter from the Executive Director, James Ford, to every Chamber of Commerce in the nation. His letter solicits active co-operation in the effort to reach every American home and help make it "more comfortable, more beautiful, cheaper and easier to manage and maintain."

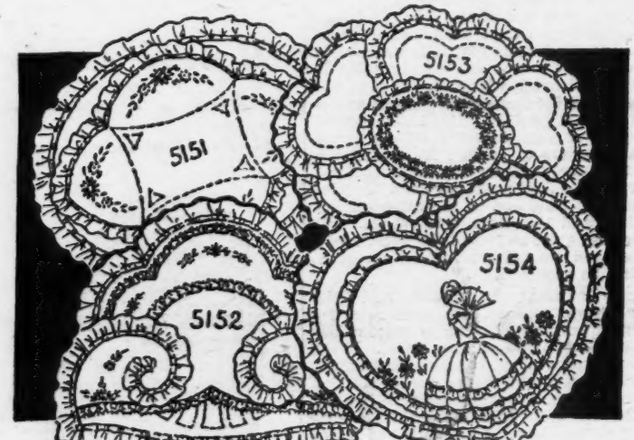
Wealthy homes may hold themselves above this aid, though some of them need it. Lavish expenditure does not insure beauty. Many a rich householder groans over the bills, while his wife bewails the difficulty of keeping the domestic machinery running smoothly.

We Orchard Women hold a middle ground between the very poor on one hand and the very rich on the other. The first are too wearisomely concerned with securing the bare necessities of life to expend much thought or energy on what seem to them non-essentials. The very rich may call in professional decorators or have conveniences or luxuries at will.

The Orchard Woman knows the pleasure of planning and executing her own ideas. Our homes have the personal touch which so endears them to us, and one of the most interesting things about them is that they are never finished.

The Orchard Woman has the Better Homes Movement much at heart. She has a good home herself and wishes to improve it until it is as pretty, as convenient, as easily and economically run as possible. She prefers to see the homes around her a credit rather than a disgrace to the neighborhood. Where this spirit prevails, we may expect to find a happy neighborhood of really "better homes."

Rayon Pillows of Beauty



Could anything appeal more strongly to your artistic taste than the rayon utility pillows shown in the designs herewith, Nos. 5151 to 5154 inclusive? They will brighten any home into which they may come and make most attractive and enjoyable accessories. They may be obtained in the following colors: Rose, Tangerine, Nile Green, Saxe Blue and Maize, and the entire pillow, both front and back is furnished, on extra good quality rayon. The price of the pillows is only 45 cents each postpaid to any address.

Embroidery Department, American Fruit Grower Magazine, 7417 Luella Avenue, Chicago, Ill.

Fashion's Fads and Fancies

THE GIRLS of Burma begin at a tender age to stretch their necks by "wearing tall tubes formed of brass rings worn tightly round the neck." They weigh about 12 pounds. Incidentally, this results in deformed jaw and collar bones, but it is purely a beauty treatment.

The Prince of Wales appears at an evening entertainment in a three-inch wide tie that completely obliterates the collar.

The flaming youth of Argentine are credited with setting the styles for men abroad. If they stay abroad, it will be all right with us. It has long been noted that styles for men slowly but surely follow fashions for women. The Argentinians have arrived at the bygone feminine fashion of pinched waists.

Men are using lip stick! At least over there. Paris is meeting the masculine demand with special "male" shades. An old song, much sung by proper young ladies of the period, expresses the correct sentiment that "The lips that touch liquor shall never touch mine." As between the two untouchables—liquor and lipstick—it almost seems as if the last state of those lips is worse than the first.

English confectioners weep for loss of trade due to the slenderizing craze. "Imports of sugar and sugar candy dropped nearly 6,000,000 cwt. in 1927 as compared with 1926." Yet America, with the slimmest of women, shows an enormous increase in the consumption of candy. Connecticut has doubled its candy sales within the year 1926. New York sold an average of nine pounds of candy for every man, woman and child!

Our flappers are all but transparent. Not merely their costumes but their diaphanous little bodies. Some dieticians who formerly forbade sweets, now ban fats only. Candy and even potatoes may be eaten so long as cream, butter, oil, meat fats, etc., are avoided.

When Spring Returns

DRIVING through the village this morning, it looked, in the early spring sunshine, as gay as youth itself. Crocus, pansies, hyacinths in the garden. In a back yard, half hidden by a budding Althea hedge, swung a clothes line as bright as the flower borders. Little pink and blue and yellow and lavender garments "dancing and fluttering in the breeze" like Wordsworth's daffodils.

From the Althea bushes rose a light cloud of sparrows. A twin flash of blue and scarlet hinted that Cardinal and bluebird would soon find very attractive nesting homes in the Althea Apartments. Happy, happy bush! It seemed to be singing to itself of how "Little friendly feathered things, Crowd to me with their rustling wings."

And there, under a great oak tree on the lawn, a woman was painting garden furniture with an enthusiasm that indicated joy in her task. I could picture the friendly afternoons of which she was dreaming as she brushed cheerful green paint over a table top.

Evidently she had in mind for her outdoor gatherings more than the conventional "'hand of bridge." In addition to the table, she had painted two trestles on which long boards might be laid to set out a banquet. There was an obvious connection between this and the crowded clothes line with its lively freight.

That household is going to have fun as soon as it gets warmer. Mother will have a cup of tea with her pals beneath the boughs of the big oak. And every time one of the children has a birthday, the long trestle table will be dressed and a line of small folks will advance upon it solemnly, as is fitting so important a function as ice cream and cutting a cake—a big cake with candles.

Taking Things Hard

THERE is at least one self-appointed burden bearer in every community. These do not belong to the class who carry out the injunction "bear ye one another's burdens." They make burdens for themselves out of the simplest materials. Their hard luck stories and their noble discharge of duty would melt a heart of stone.

They put their shoulder to the wheel every time it revolves. They are always, figuratively, panting and puffing from giving this old world a shove along its appointed path. Perhaps it would stop spinning without them.

If one listens attentively to their discourse, these overwhelming trials and efforts resolve themselves into the ordinary annoyances and occupations of everyday life. They revel in taking things hard. It is not for them to scatter sunshine or radiate sweetness and light.

Oh, how exhausted they are because a guest has spent a few days with them! And—"Of course, my dear, I haven't had a single moment to call my own." Or it may be—"No one will ever know what I suffer at the hands of that neighbor of mine. A good woman, and I'm only too glad to help, but really you know, such a grumbler! She simply wears me out." And then—"On top of all that, I just had to attend that awful meeting, and after baby was dressed he fell into the mud. I declare I don't see how I live through it all." And so on and on.

They wouldn't make such mountains out of their molehills if they knew the half-amused boredom back of the polite attention with which their tales of woe are received. Don't you sometimes feel like punching them and letting them know they are not the only ones who work and suffer?

To be honest, don't all of us sometimes realize that we need a good punching ourselves on the same score? it's easy to indulge in self-pity. A little whining now and then is relished by the best of men. But let's keep it as little as possible.

Chats with the Fruit Grower's Wife

(Continued from Page 15)

mentioned in this article have all been tried by the author or her friends and found up to "specifications." They were tried in rather poor soil with excellent results in almost every case, so they should offer no difficulties to the experienced farm homemaker and gardener.

The list suggested in the preceding paragraphs is a long one, and many of them are duplications of certain general types, as low border plants—such as spice pinks, alyssum, phacelia, lobelia, lantana, daisy, candytuft, portulaca, verbena, and love-in-a-mist; others are of medium height—balsam, stocks, periwinkle, aster, feverfew, dwarf marigold, snapdragon, coleus, clarkia, heliotrope, sweet William, petunia, etc.; others still higher include perennial phlox, giant salvia, African marigolds, centaurea, zinnia, larkspur, canterbury bells, foxgloves, salpiglossis, certain poppies, four-o'clocks, flowering tobacco, baby's breath and tritoma; the tallest include dahlias, cannas, delphiniums and sometimes foxgloves and wall flowers. Certain plants are best in beds by themselves, such as cannas, dahlias, zinnias, sweet peas, roses, gladioli, and chrysanthemums.

Seed Catalog Helpful

The best idea is to take out your favorite seed catalog and look up the various plants suggested, noting the colors, height of plant, season of bloom, size of flowers (you don't want all small flowers or all large flowers in any one bed). Draw a plan of your house yard to scale, locating trees, house, gates and existing plantings accurately. Now determine which types of flowers are needed and then decide which particular plants of that type are best suited for a given location, considering color scheme throughout the season, length and time of blooming season, and size of plants. Strive for a succession of bloom throughout the summer and fall. Make out your order and send it in, taking care to buy plenty of seed so that you can achieve a luxurious, massed effect of any given plant, rather than a few, uninteresting scattered plants. It is much better to concentrate on a few kinds of plants each year and secure quantities of thrifty, free-blooming plants than to try dozens of kinds with indifferent results. Don't forget a few perennials this year!

Ye editor has one other rule for making gardening even more fascinating than it would be otherwise—she always tries the seed for at least one new plant each year, "just to see what it's like." She picks out one or more that intrigues her interest and tries 'em in her garden. She can hardly wait for them to bloom, and has "oodles" of fun in the process. Try it yourself!

Grow Chrysanthemums in Your Own Garden

CHRYSANTHEMUM culture has been largely a commercial affair, with most of the growers striving to develop plants producing flowers as large as possible. For the amateur gardener the very large flowered commercial varieties are not generally practical, but the smaller blossoms may form one of the striking features of the autumn garden, for no other plant at that time has so great a range of color and form. The smaller blossomed plants, as a rule, flower earlier, and by selecting proper strains, it is possible to grow chrysanthemums in almost all of the United States, except the extreme northern tier of states and the hot wind-swept sections of the Great Plains. In most states north of the Ohio River and north of central New York, only the most enduring varieties of the chrysanthemum are hardy, but the summer is long enough to permit bloom on the early flowering sorts, which can be grown almost like bedding plants and wintered in frost-proof frames or cellars. In the South, except southern Florida, all types of chrysanthemums are at home.

One of the frequent causes of lack of success with chrysanthemums is failure to fertilize the soil adequately. These plants are gross feeders and when planted should have a liberal supply of stable manure or compost in the bed. Later in the summer extra feeding is advantageous. It is applied usually in liquid form, alternating liquid manure, solutions of nitrate of soda, and sulphate of ammonia. This fertilization should be stopped by the time the color begins to show in the buds.

Planning the Raspberry Plantation

(Continued from Page 7)

is often due to carelessness in handling the plants rather than to inferiority of plants when dug.

Procedure in Planting.—The plants must not be allowed to dry out during planting. Lining the inside of the containers with damp moss and covering the plants with wet burlap sacks or other material is advised. It is a good plan to dip the roots in water just before the plants are set. The spade method is commonly used and is well adapted for one person or for two people working together. The soil should be firmed about the roots, a matter worthy of more attention than most growers give. One grower co-operating with the station firmed some of his plants with a trowel and set others only fairly well firmed. The loss under the latter treatment was striking in comparison with the good stand of the former.

Immediately after black raspberry plants are set, it is a good plan to cut off the "handles" just below the surface of the ground to prevent anthracnose infection.

Distances Apart.—A common fault in planting is the setting of the rows too close. Good distances for planting blackcaps are three to three and one-half by eight feet, for purple raspberries three and one-half to four by eight feet, for blackberries three and one-half by eight feet, and for reds two and one-half to three by eight feet.

Cultivation

Cultivation should be started soon after the plants are set and should be given at frequent intervals until late summer. With young plants, at least one cross cultivation between the plants is desirable in the spring. In fruiting plantations, cultivation should begin in early spring and should be continued at frequent intervals until after picking. Unless the soil is heavy, level cultivation of the ground is best, but on heavy soils considerable ridging of the rows is advised.

Fertility

Humus.—It is important to have the soil rich in humus or decayed organic matter. This is more easily provided for when preparing the soil for planting than after the plantation has come into bearing. Turning under green manure crops or barnyard manure has a beneficial effect on the texture, physical condition, and water-holding capacity of the soil, and assists somewhat in the liberation of plant food. Leguminous crops, such as clovers or soy beans, may well be grown on the soil previous to planting bramble fruits. Care should be taken to work in thoroughly the green or stable manures. Cover crops sown in July or early August often are used to ad-

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vantage in many fruiting plantations.

Chemical Fertilizers.—Experiments with raspberries and blackberries show that the size of cane and vigor of plant are correlated with yield. The greater the size of the cane, the greater is the yield. An annual application of 150 to 300 pounds per acre of nitrate of soda or sulphate of ammonia early in the spring is recommended as a result of tests in Ohio with blackcaps. Other brambles will probably respond beneficially to nitrogen. Such fertilization increases the vigor and yield in the current season and in following seasons.

Phosphorus, potassium, and lime can sometimes be used to advantage, but the need is usually not as great as for nitrogen and the results are not as marked.

Pruning

Summer Pinching.—Pinching the young canes of black and purple raspberries during the summer is done to check terminal growth, help the development of fairly low, well branched, stocky plants, and prevent the breakage of canes. New shoots of the black raspberry are pinched when they attain a height of 18 to 24 inches, and blackberries and purple raspberries when they are 24 to 30 inches high. It is also a good plan to pinch off the laterals of blackberries when they are about a foot long. It is not advisable to cut back severely the canes of raspberries and blackberries after they have reached a height of three feet or more. Such practice tends to produce laterals from only the weakest buds on the cane. The red raspberry, unlike the blackcaps, purples, and blackberries does not seem to respond beneficially to summer pinching.

Removal of Old Canes.—Raspberry and blackberry canes, for the most part, fruit only once and then die. Whether such canes should be removed soon after the fruit is picked or left in the plantation until the time of early spring pruning is a much mooted question. On the one hand, it is claimed that the old canes are of no further value in the plantation, that their removal permits the young canes to grow without obstruction, and that cutting out and burning them soon after the harvest is over destroys the insects and diseases that are present. On the other hand, some authorities are of the opinion that the old canes serve as a protection for the new canes against winter weather, that the amount of disease, particularly anthracnose, controlled by destruction of the old canes after harvest is overesimated, and that the dead canes do not appreciably obstruct the growth of new canes. The practice followed at Wooster, and the one recommended at the present time, is to cut out and burn the old canes of raspberries soon after the close of the harvesting season. With blackberries this work is done at the time of spring pruning.

Heading Back of the Canes and Laterals while Dormant.—The regular dormant pruning of raspberries and blackberries is best done in early spring. It is usually delayed until the amount of winter injury can be ascertained but should be finished before growth starts or the soil becomes soft and muddy.

The proper amount of pruning should vary not only with the type and with the variety, but also according to the vigor and other growth conditions. Plantations where growth is not as vigorous as could be desired should be pruned somewhat more severely than those where the canes are strong and healthy. In general, pruning decreases the number of berries but increases their size.

Pruning the laterals to eight to 12 inches is suggested for most fruiting plantations of Cumberland in Ohio. For Columbian, the principal purple raspberry in the state, a pruning length of 10 to 14 inches for the laterals is generally recommended. Blackberry varieties seem to vary more greatly than blackcaps in fruiting habits. As a rule, laterals of Early Harvest can be shortened more than those of Eldorado, and laterals of Eldorado more than those of Blowers. If the laterals of blackberries are pinched back to a foot in early summer, the secondary laterals will not be as long as if this operation is omitted, and the fruit will be closer to the main cane. For laterals of Eldorado, a length of about one and one-half feet, and of Blowers around two feet, is generally recommended. The most judicious pruning of the red raspberry seems to be to cut back as lightly as is compatible with suitable training, ease of cultivation, etc. The rows of red raspberries should be kept relatively narrow.

Weak, slender canes may just as well be removed, but thinning large, strong, healthy canes of the black raspberry, for instance, to fewer than four or five in the hill is not advised. The more strong canes per hill and per acre, the higher the yield is likely to be, although the number of canes per hill can be excessive.

Propagation

There is profit to be made from plant propagation as well as from fruit production of raspberries and blackberries. Experiments of the past three years emphasize the importance of a fairly light, well-drained, fertile soil for the propagation of raspberries and blackberries. One experiment involving over 50,000 plants showed a loss of over 50 per cent of tip plants on heavy, rather wet soil in contrast to a small loss on moderately light, well-drained soil. Heaving-out was the principal factor involved.

Tip Layering.—Practically all black and purple raspberries in Ohio are propagated by tip layering in early fall. In well cared for propagation plantations, about 10 new blackcap plants can be obtained from each parent plant after a season's growth, and more than double this number the next year. The best time for layering is when the tip portions have lengthened out in snaky fashion, are somewhat leafless and more or less curled. Tips put down too early are likely to push out of the ground without rooting. Better results seem to be obtained by the use of a trowel or spade than by plowing a furrow. Tip layering in Ohio generally begins in mid-August in the southern part of the state and in early September in the northern part. The tips, under favorable conditions, become well rooted by the end of the growing season and should be left attached to the parent plant over winter. Tip plants of black raspberries are sometimes grown a year in nursery rows, and sold as transplants.

Suckers.—Most red raspberry and blackberry varieties are propagated by suckers or shoots which grow from the underground stem or roots.

Root Cuttings.—Red raspberries and blackberries are often propagated by root cuttings. Usually the cuttings are made about three inches long and are about the thickness of a lead pencil. If the cuttings are made in the fall, they are packed in moist sand or sawdust and placed in cool storage or buried outdoors over the winter in a well-drained location and then placed in nursery rows in the spring. Success is also obtained by making the cuttings in the spring and planting directly in nursery rows. A surprising number of cuttings can be grown from a plant with strong root development. Deep tillage of the red raspberry or blackberry plantation cuts the roots and induces the formation of many new plants.

Seedlings.—Plants of raspberries and blackberries grow from seed. Varieties are not reproduced true-to-name, however, in this way. Propagation from seed gives rise to new varieties. While superior varieties may be thus produced, the majority of seedlings prove inferior to standard varieties or not much better than them.

In fields where fruit production and plant propagation are combined, mixtures in varieties often result from seedlings unless the grower exercises care in the selection of his stock. Unpicked fruit falls to the ground, the seeds germinate, and seedlings arise. It is a relatively easy matter for the grower to mistake such seedlings for asexually reproduced plants. On this account, stock (blackberries particularly) is frequently not entirely true to name.

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(Continued)

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PRACTICAL ORCHARD MAN, AGE 30, WITH ten years managerial experience, available. References. Address Box 41, American Fruit Grower.

The Commercial Peach Orchard

(Continued from Page 5)

of space to be allowed between the trees. The planting distances of many peach orchards are 18 by 18 feet, 18 by 20 feet, 20 by 20 feet, or 22 by 22 feet, requiring respectively on the square plan 135, 121, 107 and 90 trees to the acre. It is true that closer planting is sometimes practiced, but it is rarely advisable, and some of our best peach orchards are planted at a distance of 24 by 24 feet, which would give 76 trees to the acre. When the trees come into bearing, one seldom if ever finds a grower who will state that he made a mistake by planting the trees too far apart. On the other hand, the statement that the trees were planted too close is a common one. Perhaps trees should not be planted closer than 20 by 20 feet, and in most cases it would be better to plant them 22 by 22 feet or even 24 by 24 feet.

The reason for leaving a greater distance between peach trees is not only to prevent the interlocking of the branches when the trees come into bearing, which would hinder orchard operations, but also to reduce competition between the root systems of the trees. As a rule, the roots of peach trees extend much farther in all directions than do the branches. In fact, the roots often overlap and compete for moisture and plant food long before the branches of opposing trees interfere with one another.

Preparation of Land.—For best results with peach trees, the land should be prepared just as for potatoes, corn, or wheat. Deep, thorough plowing followed by disking and harrowing is very essential. Tree growth on soil which has been well cultivated is likely to be much better for the first few years than on similar soil without thorough cultivation.

Laying Out the Orchard.—One of the most common ways of laying out the land for planting on the square plan is to establish a base line on one side of the field. This base line is usually not less than 15 or 20 feet from the fence or road and may be made the line for the first row of trees. End stakes several feet in length should be driven into the ground at each end of the line. If the row is long or the land uneven, one or more stakes may be needed between the end stakes. These are placed by sighting over the two end stakes. The distance between the trees is then measured off and a small stake driven down to mark the place where each tree should be planted.

Lines running at right angles to the base row are staked out in the same manner. Where the field is irregular in shape, it may be more convenient to stake out a square or rectangular block after which irregular portions of land remaining can be marked out. Where the field is large, it is usually advisable to use several stakes in locating the cross rows. Tall stakes should be provided at right angles to each other over which to sight in aligning the trees as they are planted.

A less accurate method of laying out the orchard is by plowing furrows. Measurements are made and tall stakes driven at the ends of the lines and between the end stakes whenever they cannot be seen readily. Furrows are plowed at right angles to each other by following the lines of stakes. The trees are then planted at the places where the plow furrows cross. If the soil has been well prepared, it will not be difficult to prepare the holes for the tree roots.

Preparing the Trees for Planting.—In preparing the peach trees for planting, all portions of roots which have been mutilated in digging or handling should be removed with the pruning shears. Where long slender roots appear, they should be cut off to about the length of the general root system for that particular tree. The larger and more vigorous the root system the better the tree as a rule.

Planting Operation.—Making holes for planting young trees is a simple matter, if the land is well prepared. In general, the hole should be large enough to receive the roots without bending them from their normal position, and deep enough to allow the trees to stand from two to three inches deeper after planting than they stood originally in the nursery row. This is needed as insurance against the roots becoming exposed through washing of the soil, or subsequent cultivation of the orchard.

The most important point to remember in planting trees is to insure the close packing of the soil about the roots. When a tree is placed in its hole, the soil is worked well around and among the roots. Moving the tree top slightly while pressing the roots firmly against the bottom of the hole will assist in settling the soil in cracks and crevices about the roots. After the first two or three shovelfuls have been placed on the roots, the soil should be trampled thoroughly around the tree with the feet after each shovelful is added. The trampling with the feet will give a needed firming and compacting of the soil, which will go a long way toward insuring the growth of the trees.

Pruning After Planting

The best growers generally prune peach trees soon after planting, taking into account the grade and character of the tree growth. It is usually unwise to prune strictly according to a definite standard of severity and height, regardless of all other factors. Trees are generally headed back to a height of from 16 to 24 inches. The greater height is used in the case of large, growthy trees, while less vigorous trees may be headed back close to the ground.

With a good grade of one-year-old peach trees, it is usually advisable to remove near the main trunk all but from three to five of the strongest and best placed main or scaffold branches. These main branches should be spaced alternately up and down and around the tree trunk and, if possible, from five to eight inches apart. After the main or scaffold branches are selected, they should be headed back to stubs about six or eight inches long. If the peach trees used for planting are small, it is usually well to remove all the branches close to the trunk and head the trees back to a height of about 18 or 20 inches from the ground.

(Note.—In the second article of this series, which will appear in the May issue, Dr. Talbert covers the subject of "The Care of the Young Peach Orchard.")

Commercial Fertilizers Show Improvement

COMMERCIAL fertilizers offered for sale during the past year showed a marked increase in the number of high-grade mixtures and in the number of preparations containing a high concentration of plant food without a material increase in the cost of the plant food in the fertilizers, says Dr. L. L. Van Slyke, chemist at the experiment station at Geneva, N. Y.

A general review of numerous facts in relation to commercial fertilizers offered for sale in New York in 1927 furnishes clear evidence that during the past year complete fertilizers sold in this state contained, on an average, a larger percentage of plant food than at any time in the history of the fertilizer industry, with the single exception of 1926.

There was also a marked increase in number of high-grade concentrated fertilizers, based on total content of plant food, and a relative decrease in the number of low-grade fertilizers.

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Now there are THIRTEEN new Speed Wagon Chassis—with wheelbases ranging from 115 to 175 inches—capacities from ½ ton to 3 tons—and with an average of TWO standard body types for each model.

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Hydraulic—not mechanical. Internal expanding—not external contracting. Always in adjustment, no cables to stretch, no rods to bend. Equal to every job, no matter how heavy the load. Protected against dirt and moisture—they stop you in any weather on any road, in reverse or going forward. These brakes are on ALL the new Speed Wagons—and in addition there is the independent hand lever brake operating on the propeller shaft.

New Low Prices

Here are price reductions ranging up to $260 that put Speed Wagon values even further in advance of anything else on the market today:

	Capacity	Wheelbase	Chassis Prices at Lansing
JUNIOR	½ Ton	115″	$ 895
TONNER	1 Ton	123″	995
TONNER	1 Ton	138″	1,075
STANDARD	1½ Ton	133″	1,245
STANDARD	1½ Ton	148″	1,345
GENERAL UTILITY	1½ Ton	143″	1,345
LIGHT BUS	12 Passenger	143″	1,405
MASTER	2 Ton	148″	1,545
MASTER	2 Ton	164″	1,645
HEAVY DUTY	3 Ton	159″	1,985
HEAVY DUTY DUMP	2 Cu. Yd.	130″	1,935
175″ COMMERCIAL	3 Ton	175″	2,090
175″ BUS	21 Passenger	175″	2,150

REO MOTOR CAR COMPANY, Lansing, Michigan

SPEED WAGON

Powered with six-cylinder motors

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GARDEN TRACTOR
Nothing finer for Garden Plowing, Harrowing, Seeding, Cultivating, Spraying, Lawn Mowing, Belt Power.
Instant Hitch makes all tools quickly interchangeable. Important new tools. Arched Axle, Tool Control, Power Turn and other vital features. Power Pulley for Belt Work. Time Payment plan. Write today.
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SPRAY with the OSPRAYMO High Pressure Machines

FORM a fine mist which stays on the foliage and makes the job effective. Using an OSPRAYMO means high pressure always. OSPRAYMO sprayers have the last word in mechanical agitators, with two stiff adjustable brushes working automatically in cleaning the suction strainers. No clogged pipes or nozzles. Our slogan:

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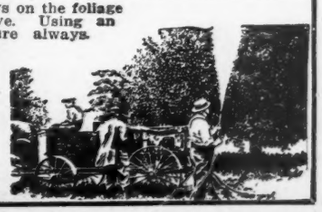
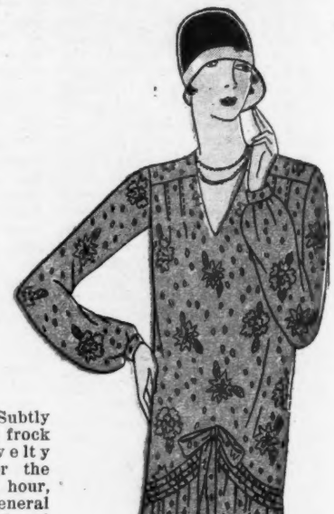


FROCKS That Carry a Special Appeal to the High School Girl

933. Intricate new details give a touch of smart individuality. Designed for sizes 16, 18, 20 years, 36, 38, 40 and 42 inches bust.

900. It cleverly combines two fabrics—supple novelty woolen with silk crepe. Designed for sizes 16, 18, 20 years, 36, 38, 40 and 42 inches bust.



618. Subtly flattering frock of novelty crepe for the luncheon hour, tea or general wear. Designed for sizes 16 years, 36, 38, 40, 42 and 44 inches bust.

865. Dashing two-piece type that has established itself definitely as the favorite sports frock. Designed for sizes 16, 18, 20 years, 36, 38, 40, 42 and 44 inches bust.

867. A bolero that gives a new elegance and is an outstanding new youthful Paris fashion for the smart bridge and tea. Designed for sizes 16, 18, 20 years, 36, 38, 40 and 42 inches bust.

804. Reveals effective simplicity, always graciously becoming to its wearer. Designed for sizes 16, 18, 20 years, 36, 38, 40 and 42 inches bust.

Patterns may be secured by mail, postage prepaid, 10 cents each, from AMERICAN FRUIT GROWER MAGAZINE Pattern Service, 22 East 18th Street, New York City. Be sure to state size required. Enclose 10c additional for copy of Spring Fashion Magazine. Contains section of movie-star styles, and 100 others.

The Japanese Quince Promises a Profit to Commercial Growers

(Continued from Page 8)

other food products where a non-volatile acidulent is required and thereby take the place of other acidulents now used. The Japanese quince could be used as an acidulent for apples in apple butter, apple sauce, apple jelly, apple cider, baked apples and canned apples; with cherries in cherry preserves, cherry pies and pie fillings, cherry jelly, crushed fountain cherry fruits and syrups, maraschino type cherries, and canned cherries; with European quinces in quince jelly, and quince preserves; and in mayonnaise dressings and powdered and liquid pectins.

Not Grown Extensively

With all these valuable properties and uses, and a ready market awaiting it, the Japanese quince fruit is little grown and scarcely known. Yet this strange and useful fruit is not new. A native of China, but introduced years ago into Europe and America from Japan, it has been little grown except for a few scarlet flowered varieties used rather extensively by landscape gardeners. Their brilliant red color is a familiar sight blooming with the yellow golden bells of forsythia in early spring. Their fruits, if any, are small in size. They seldom set fruit, however, since usually plants of only one variety have been grown together. The Japanese quince varieties, like most varieties of apples, require cross-pollination for fruit setting.

The varieties which produce medium to large sized fruit in abundance have been given scant attention, and unfortunately at the present time are but little grown, since the extreme acidity of their fruits have prevented their utilization in the common methods of cooking and preserving. Nurserymen, therefore, paid no attention to varieties for their fruiting habits. In propagating a few varieties for their brilliant colored flowers, they failed to include any of the large fruited sorts having brilliant blossoms.

Since the varieties of the Japanese quince best adapted for fruit production are not grown extensively at the present time by nurserymen, several of the better varieties are given below, probably in the order of their value, so that if a nurseryman does not grow a certain variety desired, another on the list may be substituted.

Some of the Better Varieties of the Japanese Quince

Chaenomoles lagenaria grandiflora (Figure 1), a white and pink blossom sort, has borne the largest fruit (three to four to the pound), has been the most productive and has borne the heaviest crop at the earliest age at the United States Government Experiment Station, Glenn Dale, Md., and has been very productive at Boston, Mass. It averages about four to five feet in height, and begins bearing at two to three years of age. The fruit is three to four inches in length. It contains the most l-malic acid, 5.75 per cent. As it is probably self-sterile, at least one other variety should be grown with it.

Chaenomeles Japonica versicolor (Figure 2) has borne very heavily at Boston, Mass. Other varieties known to fruit heavily are: *Chaenomeles lagenaria* Baltzii, *Chaenomeles superba* atro-sanguinea, *Chaenomeles Japonica* candidissima, and *Chaenomeles Japonica* nivalis.

Probably with careful selection, newer improved varieties even higher in l-malic acid content will be produced. Given greater commercial economic importance, undoubtedly the varieties of greatest value, at least, will break away from the European custom of attaching the scientific names, and will acquire simple common American names easy to pronounce and remember.

Culture

The plants should be set out six by 10 feet. The location of the Japanese quince orchard, planting, cultivation, pruning and spraying are similar to that for the common market varieties of European quince. The codling moth and San Jose scale are its chief pests. These are controlled by the same sprays and methods as employed for apples. The blossoms, though early, are more resistant to frost than apple blossoms, while the plants are very resistant to blight which is so destructive to European quinces and pears. The plant is very hardy and probably will grow well in all places where the common European quince thrives. It will produce well some distance further south than the southern limit established for the common European quince caused by the increasingly greater ravages of the blight.

The Japanese quince, though originating in China, must not be confused with the Chinese quince, *Cydonia sinensis*. The fruit of the latter is very large (one to four pounds each), the flesh is coarse, yellow, rather acid and darkens slowly on exposure to air. The flavor is mild but unattractive. The skin is green and highly aromatic. The specimens examined of this fruit did not appear to possess characteristics valuable to the preserving and canning industries.

Our laboratory is greatly indebted to Dr. George M. Darrow of the United States Bureau of Plant Industry, Washington, D. C., for supplying it with the fruits used and the information relative to the plant characters.

Parasite Aids in Codling Moth Control

THE AVERAGE fruit grower thinks of codling moth control in terms of spraying with lead arsenate or some other poison. This, so far, has proved to be the most practical means of control, but there are other agencies which can be used to assist the spray program.

One of these is the introduction of parasites which attack the codling moth. One of the most recently introduced parasites of the codling moth is the *Ascogaster carpocapsa*. This parasite has become well established in the vicinity of Yakima, Wash., and is increasing in numbers, according to a report made recently by the Bureau of Entomology, United States Department of Agriculture.

During 1927 a block of 58 unsprayed trees about a mile northwest of the point of original introduction of this parasite was kept banded and examined weekly. From these bands 24,800 codling moth worms have been taken during the season, of which 7000, or 31 per cent, were parasitized. Last year a parasitism of 22 per cent was found.

Approximately 1300 of the parasites which were recovered have been shipped to British Columbia for introduction there and about 1300 more have been distributed to various places in the state of Washington. The rest are being held until spring, when they will be sent to various apple growing districts in the Pacific Northwest.

Put a Four Cylinder Engine in Spray Rig

(Continued from Page 10)

plenty of power. Another thing about those car engines. Most any hired man can tinker with them when they get out of whack, but these same men usually know very little about a stationary engine."

"Well, that's about right," replied Mr. Roberts.

"I'll have to be going. See you again some time, Mr. Roberts."

"Yes, do that, Mr. Foster. Mighty glad you stopped in."

"Good day, Mr. Roberts."

"Good-bye. Stop in any time."

For every dry battery use there's an Eveready Columbia

NO MATTER what you want to use dry cells for, there is an Eveready Columbia Dry Battery that's just right. There is the famous Eveready Columbia Ignitor, the standard six-inch dry cell, 1½ volts. The Ignitor is suitable for use wherever it is sheltered—indoors, or in entirely enclosed battery boxes. Then there are three Eveready Columbia Hot Shots, 6, 7½ and 9 volts. Each Eveready Columbia Hot Shot contains the required number of cells to supply the stated voltage; cells are ready-connected, inside the water-proof steel case. Only two terminals outside, two screw nuts covered with insulation. The Eveready Columbia Hot Shot not only defies all weather conditions, and stands hard knocks in the field, but it is practically impossible for it to be short-circuited accidentally. Be sure to ask for and get Eveready Columbias.

NATIONAL CARBON CO., INC., New York—San Francisco

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EVEREADY COLUMBIA Dry Batteries -they last longer

FOR RADIO

The only way we can beat the Eveready Columbia is to make a special cell for one specific use. That's what we have done in the Eveready "A" Dry Cell Radio "A," No. 711. Made specifically for use on radio sets using dry cell tubes, and superior in that service.

ALWAYS write, in your letter to the Advertiser, "I read your advertisement in AMERICAN FRUIT GROWER MAGAZINE."

No. 90 Twelve-Tooth Harrow

Planet Jr.

The trucker's favorite

THERE'S no finer horse tool for working small fruit and garden truck than this Planet Jr. No. 90 12-tooth harrow. Twelve narrow, round-throated teeth do a fine-tooth-comb job of weeding and mulching. Looks like hand-raking when you're through. Safe in the smallest seedlings. Never covers or throws soil. Depth instantly regulated by lever. Closes to 15 inches, opens to 3 feet. Wheel hoe results with horse hoe economy. The stand-by wherever truck and fruit are raised for profit.

Ask your nearest Planet Jr. dealer for descriptive catalog—
See pages 48-50. Or write us.

S. L. ALLEN & CO., Inc., Dept. 26-D, 5th & Glenwood Ave., Phila.

Index to Advertisements

The concerns whose advertisements appear listed below are equipped to give prompt and satisfactory service to the American fruit grower. Most of them issue literature that is freely at the disposal of our subscribers. It is to the advantage of all that when writing to an advertiser you use the address exactly as it appears in the advertisement, and that you state in your letter: "I Read Your Advertisement in AMERICAN FRUIT GROWER MAGAZINE."

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For Health and Recreation
go to
Bad-Nauheim
The German Spa of World Fame
For Ease and Comfort
go to
Jeschke's Grand Hotel
run by its owner Lorenz Jeschke
Also General Manager of Grand-Hotel Gardone
North of Italy

The Editor's Mail Box

(*Continued from Page 32*)

liquid. When the moisture is finally evaporated out of this mixture, each tiny particle of lime-sulphur is sealed up in a microscopic coating of sugar. This sugar coating protects the dry lime-sulphur against deterioration, permitting the powder to be kept over from year to year. When the correct amount of water is added to the dry lime-sulphur, the "sugar coating" is dissolved and the lime-sulphur mixes in the water, it is ready for use. The sugar in the dry lime-sulphur has no value except to protect the powder until used. Neither has it any injurious effect on the liquid as a fungicide. It is important in the use of dry lime-sulphur, as with other proprietary compounds, that the instructions given by the manufacturer be followed to the letter.

Scions Did Not Grow

Editor, AMERICAN FRUIT GROWER MAGAZINE: I grafted some scions in topworking that failed to grow. If only a few had failed to grow, I would not have thought much of it, but all but one failed and that one grew very weak. The scions were cut from nursery trees just from the nursery that I set out. These trees were stored during the winter and shipped in spring, so I thought it would have been an ideal scion. I used grafting wax made of beeswax, resin and tallow according to directions.

In topworking, what size limbs should be used to set scions on? I set them on limbs one-half to two inches in diameter. —D. B. S., Iowa.

ANSWER: You would secure better scions for grafting from trees in the open ground rather than from trees dug and stored. Wood for grafting should be gathered in December, as soon as it is thoroughly hardened.

One and one-half to two inches in diameter is a practical range of size of limbs upon which to graft.

Formula for Grafting Wax

Editor, AMERICAN FRUIT GROWER MAGAZINE: Have you a recipe for grafting wax? If so, I would like to have it.—J. F. A., Nebraska.

ANSWER: The grafting wax formula is as follows: Resin four pounds, beeswax two pounds, tallow one pound, or other quantities in the same proportions. (Fat beef scraps melted, strained and cooled will provide the tallow.) Melt the resin. Add the beeswax. Stir until melted. Add the tallow, and remove from fire. Stir occasionally until the mass begins to thicken to prevent separation of ingredients. See "The Grafting Candle," in March issue, page 38.

A Question of Pollination

Editor, AMERICAN FRUIT GROWER MAGAZINE: In 1919, I bought an orchard containing 375 young pear trees. These trees have been making a good growth and are in a healthy condition. They bloom heavily every year but never bear any fruit. I would like to know what I can do to make these trees fruitful.—J. K., Kentucky.

ANSWER: You evidently have a pollination problem which can only be remedied by (1) ascertaining the variety of trees in your pear orchard, and (2) determining the proper bloom which will serve as a pollinizer. This subject will be covered in articles on pollination beginning in the May issue of the AMERICAN FRUIT GROWER MAGAZINE.

Unique Marketing Bag

EDITOR, AMERICAN FRUIT GROWER MAGAZINE: We have started something "new under the sun." Practically all our apples and potatoes are hauled away from our barn by consumers in autos and trucks. Very few people like to take bushel baskets of apples or burlap bags of potatoes in their fine cars, so we had one of our Wellsburg paper mills make us an especially heavy paper bag that holds one bushel. We then had large funnels made, with one side cut out to fit a bushel basket, to enable us to pour the apples and potatoes into the bags without bruising them. The bags are so heavy and stiff that we put the funnel in the top of the bag, bend the bag over and set the funnel on the floor. We take the basket and fill the funnel full, then catch the handles of funnel and lift bag, funnel and basket gradually, so as not to bruise the fruit.

Our customers are delighted with these bags.

We shipped 1500 bushels of apples to Kentucky in these containers and they went through in fine shape. Each sack makes a cushion for the next. The bags are easier to handle than baskets and much lighter than the two and one-half bushel burlap potato bags. Another thing, potatoes will stand much more cold weather in them.—*C. P. Waugh and Sons, Wellsburg, W. Va.*

Tying Down the Limbs of Peach Trees

EDITOR, AMERICAN FRUIT GROWER MAGAZINE: A year or two ago, if we remember correctly, we saw an article in your magazine describing a method of planting peach trees whereby no pruning was done and the limbs were tied down by means of a stout cord attached to a stake driven in the ground.

This method, it was claimed, would save the annual pruning and cause trees to bear earlier.

We have never seen orchards handled in this way and would like to know if this has proved to be a success.

We are testing some new varieties of apples and we are anxious to see them bear as early as possible to enable us to decide whether to plant more of the same variety.

If any of your readers can give us their experience we would appreciate it.—*Fugazzi Brothers, Cincinnati, Ohio.*

Nectarines for the North

PEACHES without fuzz are known as nectarines to the fruit growers and are much more in demand in Europe and on the Pacific Coast than in the East. This neglect of a very attractive fruit is due to the scarcity of good varieties adapted to eastern conditions, declare the horticulturists at the New York Experiment Station, where an effort is being made to develop superior varieties of nectarines.

One new variety, the Hunter, is being recommended by the station fruit men as well worth a trial in New York. Planting stocks are now available at cost from the New York Fruit Testing Association which co-operates with the station in the propagation and distribution of the new fruit varieties originated or recommended by the station fruit specialists.

"Nectarines are little grown in New York, chiefly because the curculio finds the smooth-skinned fruit quite to its taste and usually plays havoc with the crop," says Dr. U. P. Hedrick, station horticulturist. "But the curculio is easily controlled by spraying and does not prove a serious obstacle to the growing of nectarines in this state.

"While there are probably 200 varieties of peaches available to New York fruit growers, there are not more than four nectarines worth trying. These are Boston, Elruge, Newton and Victoria. It seemed imperative, therefore, that the station attempt to develop better varieties of nectarines.

"The Hunter is the first of the new sorts to be offered fruit growers. The tree is large, vigorous, hardy and productive. The fruits are large, handsomely colored, and of good quality. Hunter is easily the best mid-season nectarine growing on the station grounds."

A Horticultural Genius of the Ozarks

(Continued from Page 4)

fragrant bunches of grapes. Mr. Bachman rose and left the room abruptly, returning with a glorious cluster of sun-kissed fruit, which he carefully dipped in water, then held up for our inspection.

"I think I shall call this," he said, "the Garland." It was a simple tribute to the county of this name in which he had developed the variety.

This grape, which we shall therefore call the Garland, is a cross between Moore's Diamond and Bachman's Prima, and it is an extra early grape. It matures four weeks earlier than the Concord, and two weeks earlier than the well-known Moore's Early. Mr. Bachman had been at work on this grape since 1922, and it and his Bachman's Early were his choice of all the varieties in his vineyard. They would yield, he said, from 25 to 27 pounds of grapes per vine when the vines were spaced eight by eight feet apart, but would grow more and larger grapes if the vines were spaced 10 by 10 feet apart. This variety develops good roots and vigorous vines, and stands dry weather as well as any known variety.

System of Culture

The soil in the Bachman experiment garden is a gravelly loam, the grapevines are strong and vigorous and at the time of my visit were literally loaded with grapes. Every variety I saw was well fruited. Prof. Bachman used stable manure only for fertilizing, broadcasting it. He cultivated his ground well at all times, and kept it free from roots, grass and weeds. After the grape harvest, peas were planted between the rows of vines.

Disease? His vines did not have it. Any grape grower can keep his vines disease-free, Prof. Bachman said, by watching them carefully and at the first indication of a threatened invasion of insects or of black rot applying the proper remedy thoroughly. For black rot, Bordeaux mixture was used. For insects, arsenate of lead was added to the spray, and a nicotine solution was used for gnats, which occasionally attack the leaf.

It was Prof. Bachman's life work to develop a grape suitable for Arkansas soil and climate. He said the Bachman's Early and the Garland came nearest to realizing this ambition, but still he was not satisfied, and his work was active to the last in still further developing his latest—and last—variety, the Garland. Either of these two varieties, he said, would grow in the North as well as in the South, as far North as the Delawares in New York state.

Qualities of the Three Best Varieties

The Christine, while not quite so hardy, he also regarded as a splendid grape. The writer has tasted many different kinds of grapes, but is frank to say that any one of the above three varieties, Bachman's Early, Garland or Christine, is better flavored than any other grape he has ever sampled. For personal taste, he prefers the Christine, with its rich, fresh green hue, and delightfully refreshing flavor. It is like no other fruit, and no other grape quite equals its flavor. For shipping purposes and the probable buying eye of the general public, the Bachman's Early probably ranks first, with the Garland next. Mr. Bachman smiled as he said:

"You like the Christine best? Perhaps so. Well, for southern soils it is ideal, and its color when fully ripe is wonderful—like gold."

Peter Wonderlin, of the Rhine River country, pulled me aside for a chat. He was visibly impressed with Prof. Bachman's grapes, as he said to me:

"The Lord gave us, the Bible says, the grape vineyard as the closest companion of mankind, one of the first fruits and most important. He told us to keep vineyards and work them well. I have found that we do not get the full value of the grapes as we commonly eat them. They are God's greatest medicine."

Here was a simple philosopher full of a message and his words fairly tumbled over themselves as he went on:

"Grapes should be eaten whole, grinding even the seeds with the teeth, and swallowing the whole fruit. Then drink plenty of good pure water. That is all. You will never be sick, but will live your three score years and 10 in the vigor of youth."

A homely piece of philosophy, well worth reciting, and he was eager to impress it upon me. "Where many a man has been buried," he said, "there has been some life-giving herb or fruit that would have cured him, growing on the very spot where the soil was dug to put away his body."

The grape, as Peter Wonderlin so truthfully has spoken, is indeed one of the first and most important gifts to man, and, in the hands of Joseph Bachman, the plant wizard of Arkansas, it was cared for and nurtured, as the Bible stresses.

Experimented with Other Fruits as Well

He experimented not only with the grape, but with other fruits, filling with goodly measure his allotted span of life. About him these fruits grew and thrived, and he cared for them all with rare skill. Here were two sturdy young pear trees, well fruited with large green pears, the Keiffer and the Garber varieties. On one of them was a graft, from the Favorita, a Spanish pear. Always experimenting and developing new creations, and improving old ones, Joseph Bachman added much to the rich galaxy of nature's adornment of fruits under the mellowing influence of warm Arkansas sunshine, and the gentle south breezes stealing up the valley of the Cuachita foothills echoes again the name, "Bachman—Joseph!"

In a far corner of the Bachman garden is a quaint Chinese fruit tree, a variety which has been grown for 4000 years. This tree is about five feet tall, and is four years old. It is one of the five principal varieties of fruits produced in China, and was sent to Prof. Bachman to develop and experiment with in this country by the United States Department of Plant Introduction at Washington, D. C., where Joseph Bachman is known and listed as an experimenter. The fruit of this tree is called the "Jujube." In color it is greenish-yellow like a pear, in size and shape it is not unlike a green prune, and it has the rich taste of the raisin.

All these, and more, were to be found in the Bachman garden, together with a profusion of flowers and shrubs. On the wall in the little reception room in his home we looked up to see a large framed certificate. Approaching nearer, we read the legend:

"Silver Medal, World's Fair, St. Louis, Mo., 1904." Underneath this was the well-known signature of David R. Francis. And in between was the simple line: "Joseph Bachman—Grapes."

Joseph Bachman is dead? Yes and no. Living after him the works of his brain and hands shall blossom and bear fruit year after year on a thousand hills and in a thousand valleys, and drink in the warmth of God's eternal sunshine perhaps until the end of time.

Well placed groups of shrubs always go well in the general landscape. In group plantings, place the taller shrubs in the center. The group should then be banked down to the ground with a succession of shorter shrubs on the outside.

Paint will go a long way in making buildings last longer and give better service. Well painted buildings also add to the attractiveness of the farm as a home.

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COUNTY agents in 15 New York counties conducted 39 tests last year to determine the effect of Nitrate of Soda on apples. The results tell the story—it's Chilean Nitrate of Soda, not luck, that makes the profitable crop.

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Gain—due to Nitrate of Soda . . . . . 1,173 ¼ bu.

The only fertilizer used was Nitrate of Soda! The trees were similar in every respect.

Nitrate of Soda is the nitrogen that all fruit trees need. It is food for your trees, not a stimulant. Gives bigger yield of highest quality fruit. Use Nitrate of Soda this year and watch your fruit profits grow.

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Send for our new 44-page illustrated book "How to Use Chilean Nitrate of Soda." Ask for Book No. 1. If you want special apple information ask for "Profitable Apple Orchards". . . Book No. 5. Both are free. Simply tear out this ad and mail with your name and address.

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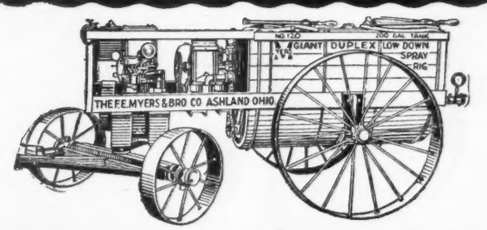

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American Fruit Grower Magazine for April

What Is Behind the Smoke in Florida?

WHEN THE growers in any field organize, and after years of steady growth, with the usual ups and downs, find themselves in control of a heavy percentage of the crop of their district or state, one of two things is bound to happen. The organization should, to the benefit of all the growers in the district or state covered, continue to grow until it controls the shipments of the commodities it was organized to market. This is the natural, logical outcome, and its attainment assures a fair prosperity for the fortunate growers affected. But this happy outcome is not so easy of attainment. Many and powerful are the interests that profit by a division among the growers. And the most successful method of keeping the growers split up is to create a rival shipping organization to operate in the same field. This ancient maneuver, with all its customary flubdub, is now well under way in the Florida citrus industry. "Citrus meetings," inspired and attended by bankers, real estate men, newspaper men, politicians and independent shippers and brokers have discussed, debated and passed resolutions. The final decision is to "organize" the citrus industry, calmly ignoring the fact that the Florida citrus industry is very highly organized. The Florida Citrus Exchange now comprises about 50 per cent of the growers and controls about 35 per cent of the tonnage of Florida citrus. It is grower owned and operated. Through well-planned advertising campaigns it has made "Sealed-Sweet" almost a household word in the nation. It has grown slowly, perhaps, but the growth has been sound, healthy. It has grown altogether too fast for some of the interests back of the present ballyhoo to "organize" the citrus industry. To fruit growers the country over the present agitation in Florida might appear worthy of no more than an understanding smile. But the situation may be more serious than it appears. Secretary Jardine has been prevailed upon to send two "experts" to Florida to "co-operate" with the interests now seeking to "organize" the Florida citrus industry. A vigorous campaign on the part of the Florida Citrus Exchange for an increase in membership—the right kind of membership—might not be out of place at this particular time. Education of the growers in proper methods of culture and spraying are of course a necessary part of any such campaign. A heavy increase in membership is not always a sign of healthy growth, unless the new members are first convinced that profits and quality travel hand-in-hand.

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Turn the Undergrade Fruit Into Profit

A SURVEY of apple orchards in the United States at this time furnishes the foundation for either an optimistic or a pessimistic forecast, for the apple grower, depending upon the angle of view. Fruit buds, as a general rule, are well set. Sufficient at least for a better-than-normal crop if frost does not intervene. The weather hangs cold, spring delays. So far the outlook for a crop is good. But what of the market if the crop sets and carries through to the harvest? Is it to be a repetition of 1926? The meritorious movement to advertise the apple, as sponsored by "Apples for Health, Inc.," is a long step in the right direction. It leaves, perforce, one phase of the problem untouched—the disposal of undergrade fruit. Last season this was no problem at all. All apples brought a profitable price. But such seasons are not the rule. Profit in any industry depends largely upon the utilization of by-products. Under-size and under-color fruit are the by-products of the fruit grower, and the success or failure of a season, from the standpoint of profit may at times hinge on the disposal of this class of fruit. The grower with a heavy volume of fruit will do well to give careful consideration to any sound plan that promises a dependable income from the fruit not in the higher commercial grades.

Invest in Fertility for Certain Returns

MORE commercial fertilizers are used by fruit growers as a class than by any other class of farmers, with the possible exception of the truck and produce growers. But a comparison of the tonnage used by the more progressive fruit growers, who plan scientifically for a definite improvement in their soil every year, with the amount used by the average fruit grower, shows there is still a wide gap between what we use and what we ought to use. Almost any soil will produce a crop of fruit—after a fashion. But the profitable crop, the fruit of size and color, is the result of supplied plant food. The heavy costs of growing a crop of fruit; the investment, spraying and cultivation are the same for a light crop of undersize fruit as for a heavy crop of A grade. When plant food can be bought cheaply, by the ton, and resold in the form of high-grade fruit, the profit on that single transaction is large and dependable. There are many hazards in growing fruit. The grower owes it to himself to invest as heavily in the one element that yields a certain profit—Fertility.

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